How to Avoid System 7.5.1 Conflicts, Page 34

JULY 1995

Macworld

THE MACINTOSH® AUTHORITY
$4.95 Canada $5.95

The Mac's New Face

Leaner, Meaner OS to Derail Windows 95, Page 84

QuickTime VR

Video Interaction Breakthrough, Page 98

Internet Connections

Low-Cost Options for Business, Page 122

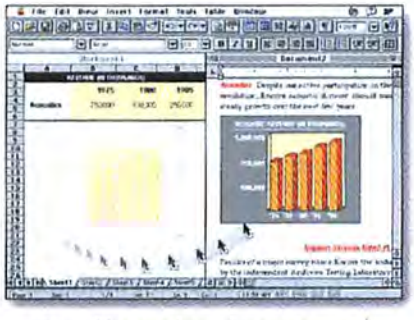
Microsoft Office 4.2 for Macintosh and Power Macintosh includes versions of Microsoft Excel, Word, PowerPoint® and a Mail workstation license.

WOULD YOU SETTLE FOR

Microsoft Office 4.2

Granted, everything in your life may not always come together. But on your Macintosh, it's another story. Because now there's a family of leading, full-featured programs for the Mac® that truly work together like one.

Microsoft® Office 4.2.



It's never been this easy to move data between programs. All you do is drag and drop.

Think of Office as programs that look alike. Programs that act alike. Programs with links between them. And finally, think of Office as programs that work so closely together, you'll feel like you're using just one.

But experience is the best teacher. So prepare a monthly report to your boss. You'll begin, of course, with Microsoft Word, our intuitive word processor.

And if you make a common typo along the way, don't worry. Word can fix it automatically, thanks to IntelliSense™ technology. It senses what you want to do, then helps you do it. Making everyday tasks automatic and complex jobs a lot easier.

Back to your report. Let's say you're making a point about sales growth. Why not add a sales chart from Microsoft Excel? Simply drag the chart into Word and let go. It's that easy.

You can even make changes to the chart, right where you are. Click on the chart and instantly all your spreadsheet tools appear. Without leaving Word.

Talk about being connected.

But wait, you forgot you have a big presentation tomorrow morning. No problem. You're

Teh→The

Now you see it. Now you don't. Set AutoCorrect to instantly fix your common typos.

at one with your Mac. Just click a button in Word and automatically turn your document into a persuasive presentation in PowerPoint.®

The fact is, the walls are down. Gone. You're now free to

*Support for the Microsoft Office is no-charge; however, normal telephone company charges apply. Microsoft support services are subject to Microsoft's then-current prices, terms, and conditions, and are subject to change without notice. © 199 separately). For information only: In the 50 United States, call (800) 709-3787, Dept. YP4. In Canada, call (800) 563-9048. Outside the U.S. and Canada, call your local Microsoft subsidiary or (206) 936-8661. Customers who are deaf or hard of hearin Microsoft Corporation. Macintosh and Mac are registered trademarks and PowerTalk, AppleScript, Power Macintosh and System 7 are trademarks of Apple Computer, Inc.

PERFECT HARMONY IN YOUR MAC?

combine words, numbers and pictures with ease, without leaving your document. Letting you focus on your work. Instead of the programs you're using.

One click turns your Word document into a PowerPoint presentation.

Better yet, no matter what you're working on, you're always working smart.

Because as we just pointed out, IntelliSense technology lends you a hand. Whether you need a quick tip in Microsoft Excel. Step-by-step assistance as you build a newsletter in Word. Or help putting together a PowerPoint presentation.

Another smart thing about Microsoft Excel, Word and PowerPoint is how much they resemble each other.

All menus and dialog boxes are virtually identical. Even toolbars look alike. So learn one program and you're on your way to learning them all.

Our spirit of consistency even extends beyond your Mac. Because you can easily share Office files between Macintosh and Microsoft Office 4.2 for Windows™. Without having to convert them.

And since Microsoft Office supports System 7™ technologies, including PowerTalk™ and AppleScript™, you're free to commune with all the latest Macintosh innovations.

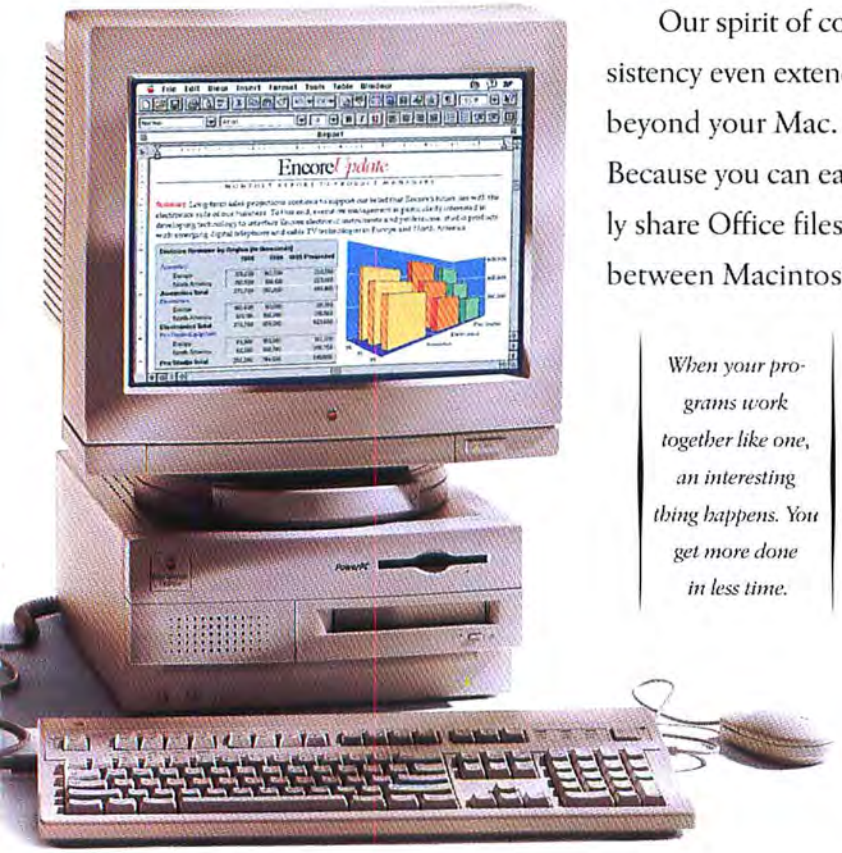
The TipWizard™ assistant can suggest easier ways for you to work.

There's even more support built into Office. Or behind it, to be exact. Our unlimited product support is available to you at no service charge.* So whenever you have a question or need help, just call.

But first, call (800) 709-3787, Department YP4, to locate the retailer nearest you. They'll help you learn all about Microsoft Office Standard 4.2 in versions for both Macintosh and Power Macintosh™.

So give us a ring.

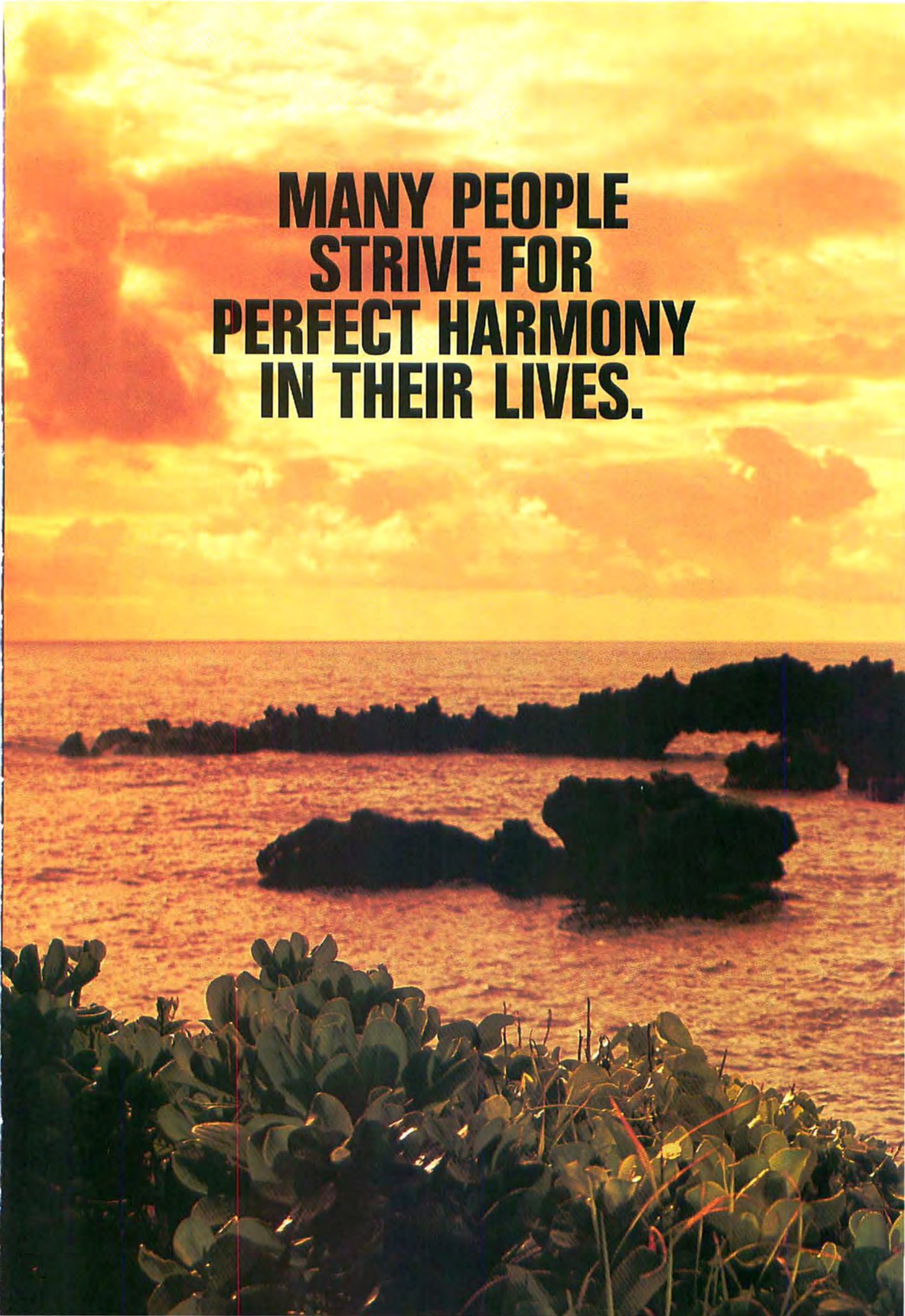
Then give your Macintosh something most people spend a lifetime searching for.



When your programs work together like one, an interesting thing happens. You get more done in less time.

Microsoft Office

Microsoft Corporation. All rights reserved. Microsoft Office Standard edition, shown here, includes: Microsoft Excel, Word, PowerPoint presentation graphics program and a Mail workstation license (server and software must be acquired
can reach Microsoft text telephone (TT/TDD) services by calling (800) 892-5234 in the United States or (905) 568-9641 in Canada. Microsoft and PowerPoint are registered trademarks and IntelliSense, Windows and TipWizard are trademarks of


MANY PEOPLE
STRIVE FOR
PERFECT HARMONY
IN THEIR LIVES.

IT'S OKAY TO START YOUR PRESENTATION WITH A JOKE. AS LONG AS THE JOKE ISN'T YOUR MONITOR.

There's nothing funny about a presentation monitor that makes a lousy impression. And we kept that in mind when we designed the new MultiSync® XM and XP Series multimedia monitors. They're nothing less than you'd expect from NEC, the leader in display technology.

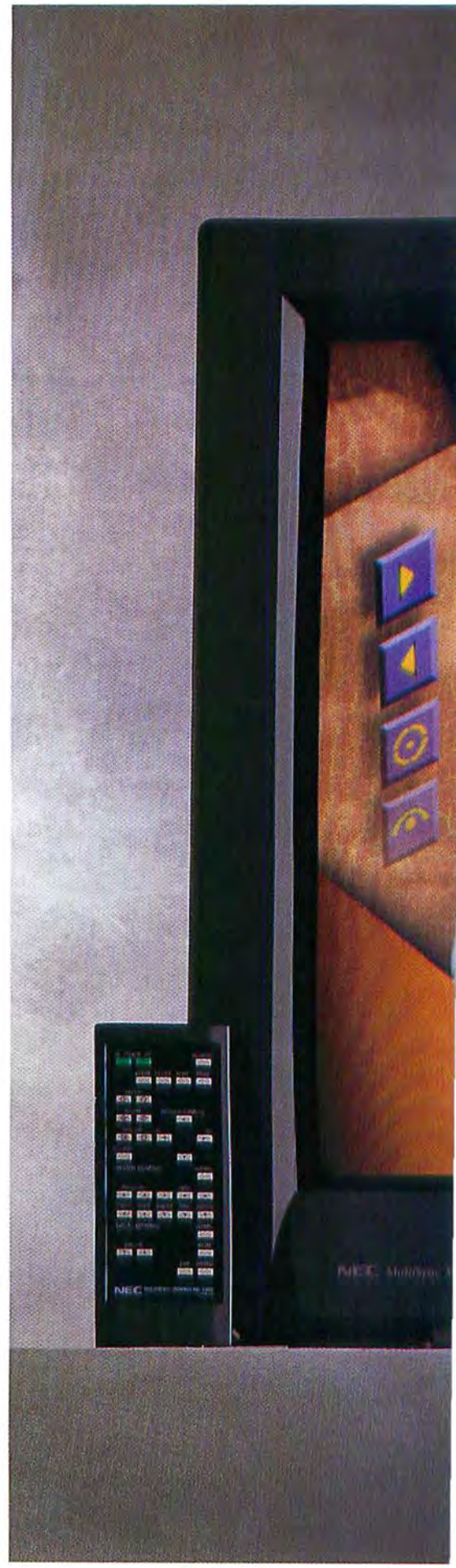
MultiSync XM29™
29" Flat Square Technology CRT
(27" viewable image size)
Max. Res: 1024 x 768
Horiz. scan range 15-50 kHz

MultiSync XM37™
37" Flat Square Technology CRT
(35" viewable image size)
Max. Res: 1024 x 768
Horiz. scan range 24-50 kHz

MultiSync XP37™
37" Flat Square Technology CRT
(35" viewable image size)
Max. Res: 1280 x 1024
Horiz. scan range 24-78 kHz

If you display computer or video sources, or if you need stereo audio, these monitors do it all. And they do it big. With 35" or 27" of sharp, clear images that will make your audience take notice.

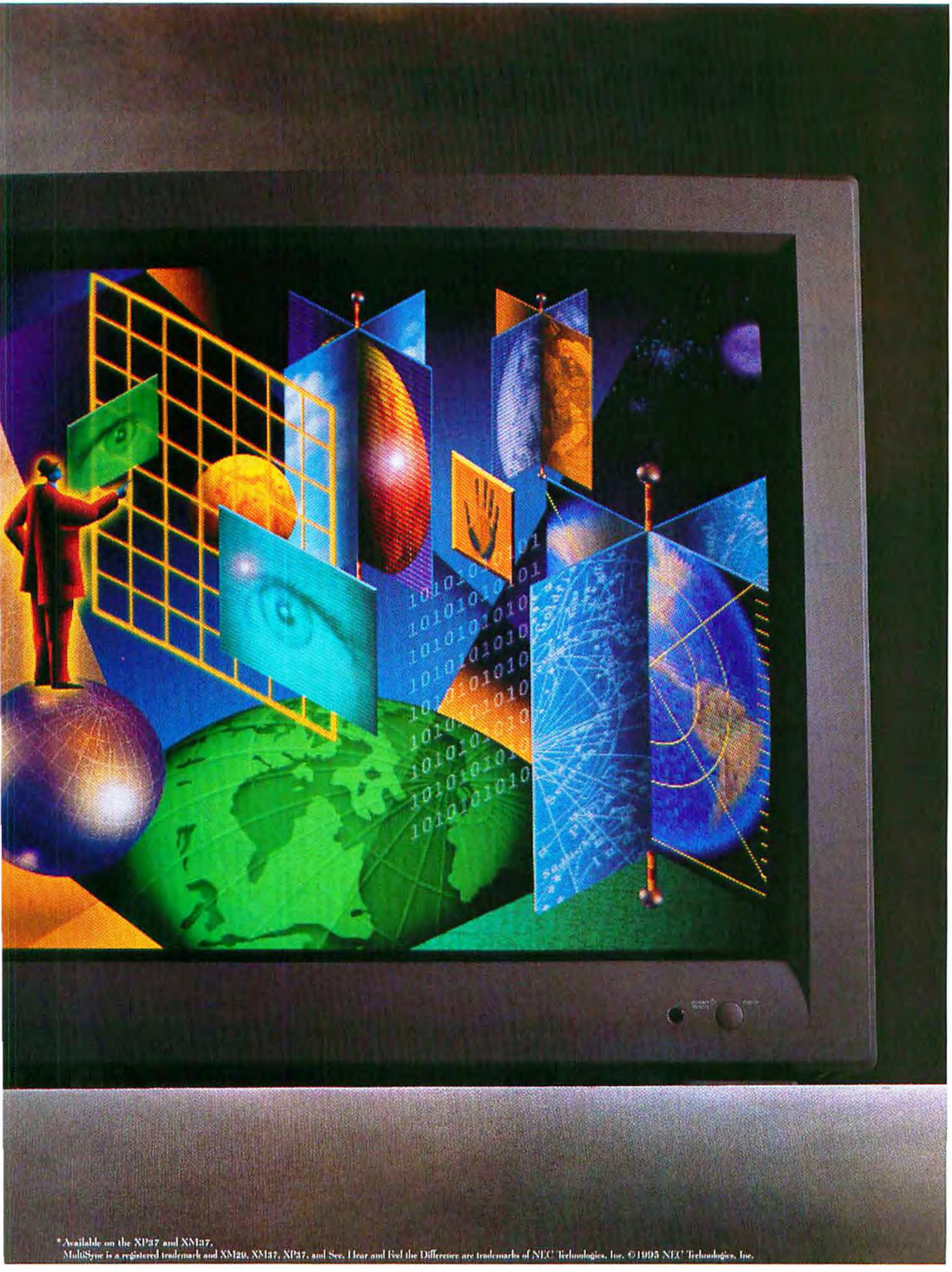
Above all, these monitors are easy to use. You can connect up to 4 sources at once and switch between them using our full-featured remote control. And our on-screen menu system* lets you easily handle image adjustments. For great presentations get an NEC MultiSync multimedia monitor – and practice your jokes. For more information call 1-800-NEC-INFO or for information via fax call 1-800-366-0476 and request catalog #1.



SEE, HEAR AND FEEL THE DIFFERENCE.™

NEC

Circle 15 on reader service card



*Available on the XP37 and XM37.
MultiSync is a registered trademark and XM20, XM37, XP37, and See, Hear and Feel the Difference are trademarks of NEC Technologies, Inc. ©1995 NEC Technologies, Inc.

Contents

MACWORLD THE MACINTOSH® AUTHORITY JULY 1995

Features

84 The New Mac OS Unveiled
BY GALEN GRUMAN A first look at the operating system of tomorrow—Apple's Copland. Can this successor to System 7.5 tackle Windows 95?

92 The Mac's Jazzy New Face
BY GALEN GRUMAN The Mac's already easy-to-use interface just gets better and better.

98 VR: QuickTime's New Edge
BY JIM HEID Virtual reality meets QuickTime—an inside look at Apple's newest version of its motion-video favorite, QuickTime VR.

106 Superfast Storage
MW LAB
BY MATTHEW LEEDS For top performance, nothing beats a SCSI-2 Fast/Wide drive. Macworld Lab tests 12 drives to find the best system for optimum performance.

112 The Future of SCSI
BY JIM HEID SCSI-3—Ultra SCSI, Fiber Channel, SSA, and FireWire—is slated to be the next Mac standard. A concise explanation of the benefits and drawbacks of each.

Two easy-to-use digital cameras, in At Work news, page 122.

News

33 MacBulletin

34 News System 7.5.1 update woes • Power Computing ships clones • The end of SIMMs?, and more

41 Power Mac News Symantec C++ for Power Mac ships • Power Watch: MATLAB, Spyglass Plot, and more

43 Macworld Online Online fun: Dilbert, Buzznet web sites • Shareware games, and more

45 New Products

The wait is over—Symantec ships C++ for the Power Mac, page 41.

Opinion

19 State of the Mac
BY ADRIAN MELLO Coping with a Mac in flux.

25 Letters

143 The Desktop Critic
BY DAVID POGUE Modern medicine, CD-style.

147 Conspicuous Consumer
BY DEBORAH BRANSCUM Tales of a Mac buyer, part II.

238 Wise Guy
BY GUY KAWASAKI Whiners with a lawsuit.

Graphics

118 **News** Custom color calibration • QuickDraw GX rides again • Flexible, rollable digitizer tablet, and more

120 **Expert Graphics**
BY CATHY ABES Graphics professionals share their secrets.

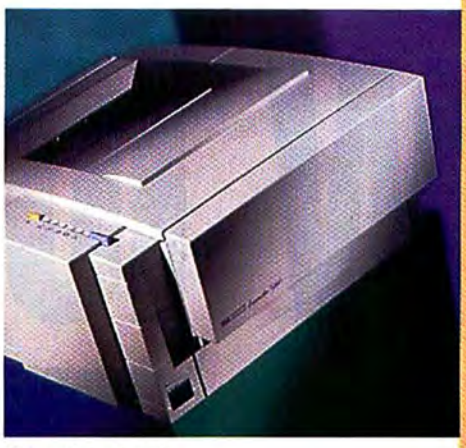
At Work

122 **News** Low-cost Internet options • Color printers get down to business • Goof-proof digital cameras, and more

125 **Working Smart**
BY JIM HEID Make presentation slides with a desktop film recorder.

129 **Quick Tips**
BY LON POOLE Tips, tricks, and shortcuts.

Yeow! Apple ships conflict-ridden System Update 1.0, in News, page 34.



HP's professional-quality personal printer, the LaserJet 5MP, reviewed page 58.

Networks

138 **News** Macs as Internet servers • Faster workgroup servers • Remote-access options galore, and more

141 **PowerBook Notes**
BY CARY LU Using your PowerBook abroad.

Buyers' Tools

151 **Editors' Choice**
Top picks from our comparative articles.

153 **Star Ratings**
Hardware and software reviews at a glance.

161 **Streetwise Shopper**
Hardware and software bargains: discounts, bundles, upgrades.

14 **How to Contact Macworld**

IDG

July 1995, Volume 12, Number 7 Macworld (ISSN 0741-8647) is published monthly by Macworld Communications, Inc. Editorial and business offices: 501 Second St., San Francisco, CA 94107, 415/243-0505. Subscription orders and inquiries should be directed to 800/288-6848 or 303/604-1465, or fax 415/442-0766. Subscription rates are $30 for 12 issues, $60 for 24 issues, and $90 for 36 issues. Foreign orders must be prepaid in U.S. funds with additional postage. Add $18 per year for postage for Canada and Mexico subscribers. Add $69 per year for postage to all other countries. Second-class postage paid at San Francisco, California, and at additional mailing offices. **Postmaster:** Send address changes to Macworld, P.O. Box 54529, Boulder, CO 80323-4529. Printed in the U.S.A.

ON THE COVER
Photo by Stan Musilek.

Reviews

56 **Vision 3d 4.0**
3-D modeler and renderer

58 **LaserJet 5MP**
Personal printer

59 **Zip Drive**
Storage

60 **xRes 1.11**
Image editor

61 **Pictura 310**
Color printer

62 **Symantec C++ 8.0**
C++ compiler for Power Macintosh

63 **Fujitsu ScanPartner Jr.**
Desktop scanner

63 **FileWave 2.1.2**
Software-distribution tool

65 **CD-Q 2.0**
Photo CD plug-in utility

67 **Vista-S8**
24-bit color flatbed scanner

67 **PhotoFlash 2.0**
Image-editing utility

69 **CreativePartner**
Network system for creative media

71 **Multimedia Utilities 1.1**
QuickTime utilities

71 **ProTerm Mac 1.0**
Telecom software

73 **CD Directory 1.0; RapidCD 1.04**
CD accelerators

75 **OptiMem RAM Charger 2.0.1**
Memory-management utility

75 **MacAlly**
ADB mouse

77 **GlidePoint**
Input device

77 **FolderBolt Pro 1.0.3**
Security software

79 **FullPixelSearch 1.5**
Image-analysis software

79 **YST-SS1010**
Speaker system

81 **Alien Skin Textureshop 1.0**
Texture generator

81 **Select 1.6**
CMYK color-correction plug-in

How To Make

Make It With Macromedia's New Graphic Design Studio.™

Mike Scaramozzino of DreamLight, Inc. made it for Bose Corporation. And now you can make design history too with four of the most powerful tools ever assembled for Macintosh or Windows. The Macromedia Graphic Design Studio, now just $995 SRP.

When Bose Corporation came to DreamLight with an advertising deadline crashing down, they needed a miracle. So Mike Scaramozzino did what successful designers everywhere are doing– produced incredible results in record time with the time saving synergy of Macromedia's Graphic Design Studio. FreeHand™ for 2D design. MacroModel™ for 3D. And Fractal Design Painter® for special effects and final integration.

With FreeHand's powerful WYSIWYG 2D drawing tools, he created the front, top and side profiles of a totally new, digital concept car. Then, using MacroModel's powerful spline-based modeling and real-time rendering, he combined the profiles and created a 3D image as "fluid" and lifelike as an automotive photograph. After applying skins, he finished the headlights and other details with textures and reflections that could only be created in Fractal Painter.

Note: These images are not photographs.

MADE WITH M MACROMEDIA

Sure, it's impressive that creating this digital dream machine, from scratch to successful ad campaign, took just 4 weeks. But if you're more interested in results, this has to be an all-time legend: Not only did Scaramozzino get the project in on-time and on budget, the Society of Illustrators in Los Angeles gave it their thumbs-up

Save A Bundle!

Save Almost! $1600

Make It With The Macromedia Graphic Design Studio, only $995!

Make it in design with the four powerful packages in the Macromedia Graphic Design Studio: FreeHand 5 (4.0 on Windows), MacroModel 1.5 and Pixar's RenderMan, Fontographer 4.1 (3.5 on Windows) and Fractal Design Painter 3.0. *Available for Macintosh and Windows.*

Only $149

Quark XPress Offer!

Move to the power of FreeHand 5.0 for the Mac for $149. Available to current FreeHand users and users of Quark XPress, Canvas, MacDraw, Adobe Illustrator and PageMaker.***

It In Design.

by publishing the composite illustration in the *1995 Illustration West Annual.*

For A Limited Time, Make It For $995.

Now you can get the same successful Macromedia Graphic Design Studio tools that Mike Scaramozzino used for only $995!

For starters, you get new FreeHand with hundreds of features to make your artistic visions a reality. From page layout to cutting-edge illustration, if you can dream it, you can make it with FreeHand.

Next, move your 2D designs to the photorealistic world of 3D with the fast, spline-based modeling and real-time editing of MacroModel. It even includes Pixar's RenderMan for photorealistic rendering.

To finish your designs with flair, plug in Fractal Design Painter and create incredible special effects, or draw with natural media like crayons, watercolors, oil paints and airbrushes.

Then use the fantastic Fontographer® to modify existing typefaces or create entirely new ones for the ultimate in custom type creation.

Four powerhouse programs at almost $1600 off the SRP. That's all the power you need to grab the glory in design. Call now for our free Showcase CD and see how designers just like you have used the power of Macromedia to make it big-time in design. Ask Mike Scaramozzino of DreamLight, Inc. what unlimited creative potential is all about and he'll tell you. If you want to make it in design, you've got to make it with Macromedia.

Mac OS

"We needed the power of FreeHand, MacroModel and Painter to get our creative vision out of the showroom and into the light of day."

Mike Scaramozzino
Founder/Creative Director
DreamLight, Inc.
Stoneham, MA

FREE SHOWCASE CD-ROM*
1-800-480-3288

ASK FOR OPERATOR #1414
EVERY 200TH CALLER GETS FREEHAND OR FONTOGRAPHER FREE!
THAT'S UP TO A $595 VALUE!**

MACROMEDIA®

Circle 243 on reader service card

*Hurry, quantities limited. One CD per caller. **Free FreeHand or Fontographer offer expires on June 31, 1995. One call per person and is limited to the first 10,000 callers. ***Proof of ownership required. Upgrade offer expires Sept. 30, 1995. Prices are suggested retail prices and are subject to change without notice. Offers are valid in the U.S. and Canada only. Outside the U.S. or Canada call 1-415-252-2000 or FAX us at 1-415-626-6334. In Europe call +(44) 344-76-1111. Macromedia, the Macromedia logo and Fontographer are registered trademarks of Macromedia, Inc. MacroModel and FreeHand are trademarks of Macromedia, Inc. Fractal Design Painter is a registered trademark of Fractal Design Corporation. Pixar is a registered trademark and RenderMan is a trademark of Pixar. All other registered marks and trademarks are the property of their respective holders. ©1995 Macromedia, Inc. All rights reserved. Images courtesy of DreamLight Inc., Stoneham, MA.

Do You Have $100,000 To Spend On Document Imaging?

We Didn't Think So.

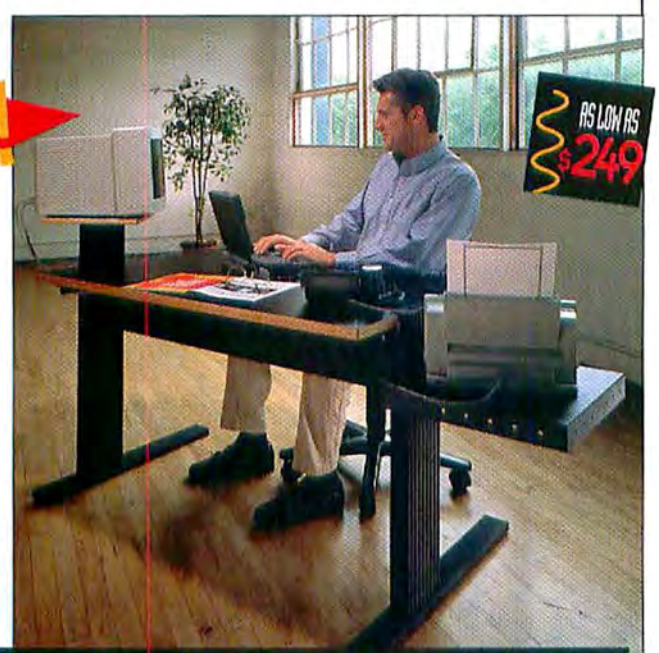
FINALLY...a cost-effective, full-featured document management solution. Discover today how scanning, OCR, and full-text search will increase organization and productivity for your workgroup.

I M A X I S

Call 1-800-IMAXIS-0
1-800-462-9470 or 703-204-2114

Circle 105 on reader service card

"The Best Mac Desk Ever."



- Ergonomic
- Fully Adjustable
- Strong
- Guaranteed
- VAR Inquiries Welcome

agio™
BEAVERTON, OREGON

Free Catalog! 800.688.2446

| Phone 503. 690.1400 | FAX 503. 690.1423 | Europe 011.41.62.631026 | Japan 011.81.3.3583.0436 |

Macworld

PRESIDENT/CHIEF OPERATING OFFICER	Colin Crawford
ASSISTANT TO THE PRESIDENT	Sharon Sanderson
DIRECTOR OF FINANCE	Stephen Daniels
BUSINESS MANAGER	Lisa Buckingham
FINANCE ASSISTANT	Eos de Feminis
DIRECTOR OF HUMAN RESOURCES	Shelly Ginenthal
HUMAN RESOURCE REPRESENTATIVE	Marisa Chow
DIRECTOR OF CORPORATE INFORMATION SYSTEMS	Walter J. Clegg
CORPORATE BUSINESS MANAGER	Christina W. Spence
ACCOUNTING/OPERATIONS MANAGER	Pat Murphy
ACCOUNTING/FACILITIES MANAGER	Michelle Reyes

THIS ISSUE OF MACWORLD
IS DEDICATED TO
JO-ANN STURTRIDGE (1940–1995),
WHO WILL BE MISSED BY HER FRIENDS AND
COLLEAGUES AT MACWORLD
AND IN THE MACINTOSH INDUSTRY.

MACWORLD is a publication of International Data Group, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. International Data Group publishes over 220 computer publications in 64 countries. Forty million people read one or more International Data Group publications each month. International Data Group's publications include: **ARGENTINA'S** Computerworld Argentina, Infoworld Argentina; **ASIA'S** Computerworld Hong Kong, PC World Hong Kong, Computerworld Southeast Asia, PC World Singapore, Computerworld Malaysia, PC World Malaysia; **AUSTRALIA'S** Computerworld Australia, Australian PC World, Australian Macworld, IDG Sources, Reseller, Network World, Mobile Business Australia; **AUSTRIA'S** Computerwelt Oesterreich, PC Test; **BELGIUM'S** Data News (CW); **BRAZIL'S** Computerworld, Game Power, Super Game, Gamepro, Mundo IBM, Mundo Unix, PC World; **BULGARIA'S** Computerworld Bulgaria, Edworld, PC & Mac World Bulgaria, Network World Bulgaria; **CANADA'S** Direct Access, Graduate Computerworld, InfoCanada, Network World Canada; **CHILE'S** Computerworld, Informatica; **COLOMBIA'S** Computerworld Colombia; **CZECH REPUBLIC'S** Computerworld, Elektronika, PC World; **DENMARK'S** CAD/CAM WORLD, Communications World, Computerworld Danmark, LOTUS World, Macintosh Produktkatalog, Macworld Danmark, PC World Danmark, PC World Produktguide, Windows World; **ECUADOR'S** PC World; **EGYPT'S** Computerworld Middle East, PC World Middle East; **FINLAND'S** MikroPC, Tietovikko, Tietoverkko; **FRANCE'S** Distributique, Golden Mac, InfoPC, Languages & Systems, Le Guide du Monde Informatique, Le Monde Informatique, Telecoms & Reseaux; **GERMANY'S** Computerwoche, Computerwoche Focus, Computerwoche Extra, Computerwoche Karriere, Information Management, Macwelt, Netzwelt, PC Welt, PC Woche, Publish, Unit; **GREECE'S** Infoworld, PC Games; **HUNGARY'S** Alaplap, Computerworld SZT, PC World, PC Virlag; **INDIA'S** Computers & Communications; **IRELAND'S** Computerscope (Computerworld); **ISRAEL'S** Computerworld Israel, PC World Israel; **ITALY'S** Computerworld Italia, Lotus Magazine, Macworld Italia, Networking Italia, PC World Italia; **JAPAN'S** Information Systems World, Computerworld Today, Nikkei Personal Computing (PCW), Macworld Japan, SunWorld Japan, Windows World; **KENYA'S** East African Computer News; **KOREA'S** Computerworld Korea, Macworld Korea, PC World Korea; **MEXICO'S** Compu Edicion, Compu Manufactura, Computacion/Punto de Venta, Computerworld Mexico, MacWorld, Mundo Unix, PC World, Windows; **THE NETHERLANDS'** Computable (CW), Computer Totaal, LAN Magazine, MacWorld; **NEW ZEALAND'S** Computer Listings, Computerworld New Zealand, New Zealand PC World; **NIGERIA'S** PC World Africa; **NORWAY'S** Computerworld Norge, C/world, Lotusworld Norge, Macworld Norge, Networld, PC World Ekspress, PC World Norge, PC World's Product Guide, Publish World, Student Data, Unix World, Windowsworld, IDG Direct Response; **PANAMA'S** PC World Panama; **PERU'S** Computerworld Peru, PC World; **PEOPLE'S REPUBLIC OF CHINA'S** China Computerworld, China Infoworld, China Network World, PC World China, IDG Shenzhen's Computer News Digest, Electronics International, IDG HIGH TECH Beijing's New Product World; **PHILIPPINES'** Computerworld, PC World; **POLAND'S** Computerworld Poland, PC World/Komputer; **PORTUGAL'S** Cerebro/PC World, Correio Informatico/Computerworld, Macin; **ROMANIA'S** PC World, Computerworld; **RUSSIA'S** Computerworld-Moscow, Mir-PC, Sety; **SLOVENIA'S** Monitor Magazine; **SOUTH AFRICA'S** Computing S.A., Network World S.A., Computer Mail; **SPAIN'S** Amiga World, Computerworld Espana, Communicaciones World, Macworld Espana, NextWorld, PC World Espana, Publish, Sunworld, Super Juegos Magazine (GamePro); **SWEDEN'S** Attack, ComputerSweden, Corporate Computing, Lokala Natverk/LAN, Lotus World, MAC&PC, Macworld, Mikrodatorn, PC World, Publishing & Design (CAP), Datalingvoren, Maxi Data, Windows World; **SWITZERLAND'S** Computerworld Schweiz, Macworld Schweiz; **TAIWAN'S** Computerworld Taiwan, Global Computer Express, PC World Taiwan; **THAILAND'S** Thai Computerworld; **TURKEY'S** Computerworld Monitor, Macworld Turkiye, PC World Turkiye; **UKRAINE'S** Computerworld; **UNITED KINGDOM'S** Computing/Computerworld, Connexion/Network World, Lotus Magazine, Macworld, Sunworld; **UNITED STATES'** AmigaWorld, Cable in the Classroom, CD Review, CIO, Computerworld, Desktop Video World, DOS Resource Guide, Electronic Entertainment Magazine, PlayRight, Power PC World, Federal Computer Week, Federal Integrator, GamePro, IDG Books, InfoWorld, InfoWorld Direct, Laser Event, Macworld, Multimedia World, Network World, PC Letter, PC World, Publish, SunWorld, SWATPro, Video Event; **VENEZUELA'S** Computerworld Venezuela, MicroComputerworld Venezuela; **VIETNAM'S** PC World Vietnam.

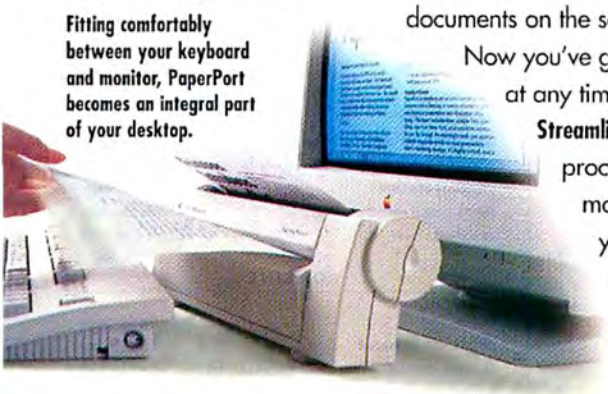
PaperPort.™ The fastest way to get paper into your Mac.

If it's on paper, it's PaperPort-able!

Okay, so you have no trouble getting paper out of your Mac. But what do you do with the articles, letters, receipts, and business cards—the important papers—that cross your desk every day? You use PaperPort, that's what! The first truly simple, super-small input device that converts your paper documents into electronic ones. **Always ready to go.** Just plug PaperPort into your Mac's printer or modem port and then feed in a piece of paper. PaperPort grabs the paper, scans it and launches the software automatically—there isn't even an ON button! **Instantly useful.** At six seconds per page, PaperPort begins to display your documents on the screen even before you're through entering them! Now you've got permanent electronic copies that you can retrieve at any time, using PaperPort's easy-to-use search tools.

Streamline your work. With PaperPort's direct links to word processors, OCR software (included!), printers and fax modems, you can file, edit, annotate, print and send your documents directly to others. Want to find out more? Call us at 800-787-7007, ext. 200.

PaperPort. It's the in thing for your Mac.



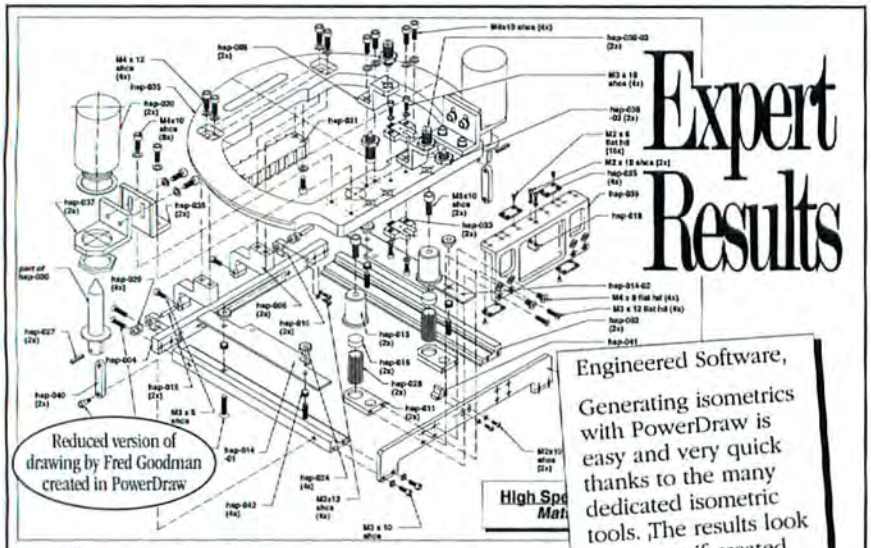
Fitting comfortably between your keyboard and monitor, PaperPort becomes an integral part of your desktop.

Once your document's in, one click will print it, another will fax it. And a third will OCR scan it. What could be easier?

MACWORLD MW ★★★★★

VISIONEER

Circle 18 on reader service card



Expert Results

Engineered Software,

Generating isometrics with PowerDraw is easy and very quick thanks to the many dedicated isometric tools. The results look sharp—as if created using time-honored technical illustration techniques!

PowerDraw does for CAD what the Mac did for computers.

Sincerely,
Fred Goodman

PowerDraw™

IN 41 COUNTRIES AROUND THE WORLD

1990 Honorable Mention Macher

MACWORLD MW EDITORS' CHOICE Jan. 1993

ENGINEERED SOFTWARE™

CALL 910-299-4843 OR FAX 910-852-2067 • IN CANADA 204-453-8111

Circle 12 on reader service card

Keep the Flame Alive

The lamp of freedom and the light of learning can take many forms.

Your company's used computers, laser printers, modems, and other surplus equipment can help empower young minds in America, and advance the development of emerging democracies around the world.

The East West Foundation takes your surplus or used equipment and distributes it to American schools and charities and to democratic and educational institutions in Eastern Europe, Africa, Asia, the Commonwealth of Independent States, and Latin America—wherever it can make a difference. And it *does* make a difference.

Donating used or overstock computer equipment to the East West Foundation can make a difference to you, too—at the bottom line. Because all donations are tax-deductible. And all types of computer equipment are welcome.

To arrange for a donation or for more information, please call:

EastWestFoundation
49 Temple Place
Boston, MA 0211
(617) 542-1234
Fax (617) 542-3333

EAST WEST
EDUCATIONAL DEVELOPMENT FOUNDATION

A Not-For-Profit Corporation

Macworld

EDITOR-IN-CHIEF Adrian Mello

EDITORIAL

EXECUTIVE EDITORS Galen Gruman, Carol Person
DIRECTOR OF EDITORIAL OPERATIONS Jane Lagas
SENIOR EDITOR/FEATURES Charles Piller
SENIOR ASSOCIATE EDITOR/FEATURES Dan Littman
SENIOR ASSOCIATE EDITOR/NEWS Tom Moran
ASSOCIATE EDITOR/GRAPHICS Cathy E. Abes
ASSOCIATE EDITOR/DEPARTMENTS Marjorie Baer
ASSOCIATE EDITOR/AT WORK Cameron Crotty
ASSOCIATE EDITOR/NETWORKS Elizabeth Dougherty
ASSOCIATE EDITORS/REVIEWS Michael Fainter, Wendy Sharp
ASSISTANT EDITORS Suzanne Courteau, Jim Feeley, Joanna Pearlstein
ADMINISTRATIVE ASSISTANTS Becky Bond, Lyn Taylor
ASSISTANT TO THE EDITOR-IN-CHIEF Patricia Carberry-Harris
CONTRIBUTING EDITORS Deborah Branscum, Robert C. Eckhardt, Erfert Fenton, Jim Heid, Guy Kawasaki, Steven Levy, Cary Lu, Deke McClelland, Tom Negrino, David Pogue, Lon Poole, Steve Roth, Joseph Schorr, Charles Seiter, Franklin N. Tessler
INTERNATIONAL EDITORS Osmund Iversen, Australia, 011 61 2 439-5133; Marianne Fajstrup, Denmark, 011 4536 44 28 00; Michael Thevenet, France, 011 33 1 49 04 79 00; Stephan Scherzer, Germany, 011 49 89 3 60860; Enrico Lotti, Italy, 011 39 2 58 011660; Osamu Honma, Japan, 011 81 3 5276-0541; Shin Cho, Korea, 011 82 2 579-8031; Oscar Kneppers, Netherlands, 011 31 23 354554; Toralv Ostvang, Norway, 011 47 22 05 3000; Alvaro Ibariez, Spain, 011 34 1 319 4014; Nicklas Mattsson, Sweden, 011 46 8667-9180; Cuno Schneeberger, Switzerland, 011 41 1 387 4429; Cemal Balci, Turkey, 011 90 1 279 1180; Peter Worlock, United Kingdom, 011 4471 831-9252

LAB

LAB DIRECTOR Lauren L. Black
SENIOR TECHNICAL ANALYSTS Mark Hurlow, Tim Warner
TECHNICAL ANALYSTS Matthew R. Clark, Danny Lee

COPY EDIT AND EDITORIAL PRODUCTION

MANAGING EDITOR Charles Barrett
ASSISTANT MANAGING EDITOR Ruth Henrich
EDITORIAL PRODUCTION MANAGER Jeff Sacilotto
SENIOR COPY EDITOR Katherine L. Ulrich
COPY EDITOR Paul Michael King
PRODUCTION EDITORS Lisa Brazieal, Doreen Engelmann

ART AND DESIGN

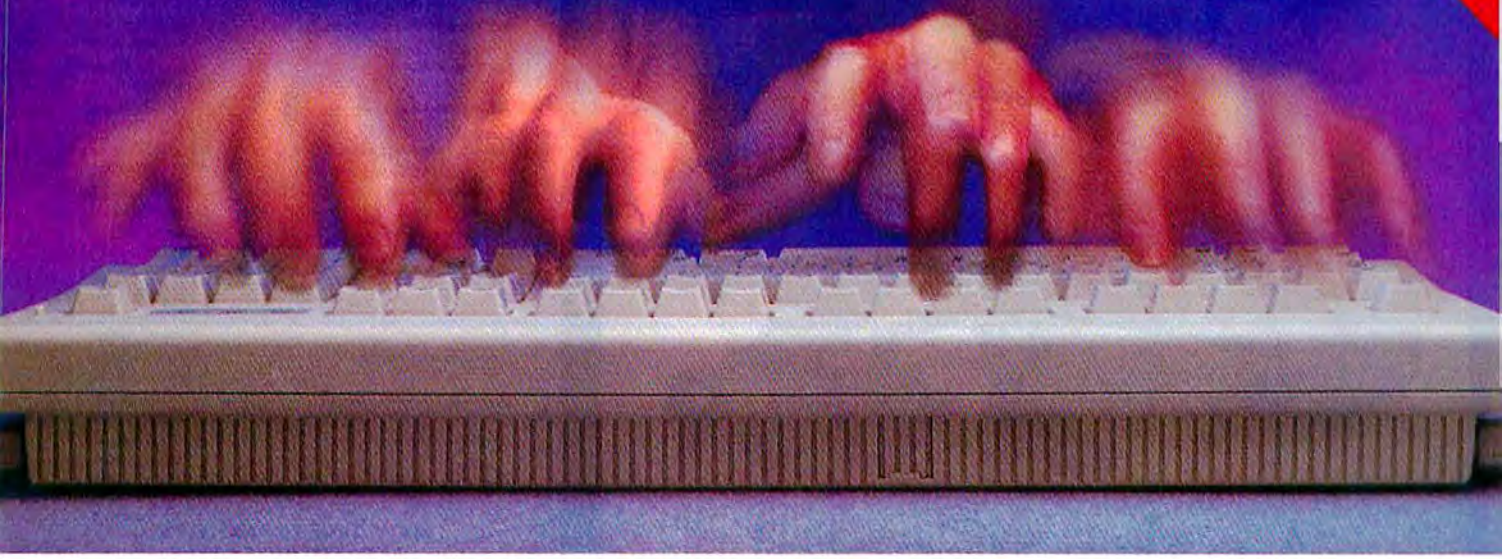
DESIGN DIRECTOR Dennis McLeod
ART DIRECTOR Joanne Hoffman
SENIOR DESIGNER Leslie Barton
SENIOR DESIGNER/INFORMATIONAL GRAPHICS Arne Hurty
ASSOCIATE ART DIRECTORS Sylvia Benvenuti, Kent Tayenaka
ASSOCIATE DESIGNER Tim Johnson
SENIOR DESIGN ASSOCIATE Martha Katt
DESIGN ASSOCIATE Belinda Chlouber

ONLINE

EDITOR Suzanne Stefanac
ONLINE ADMINISTRATOR Steve Costa
CONTENT ENGINEER Paul Devine
ONLINE PRODUCTION EDITOR Matthew Hawn
PRODUCTION ASSISTANT Kristine Moss

OmniPage Pro. Think of it as an accurate 1500 wpm typist who never takes a coffee break.

Accelerated for Power Macintosh



Try this powerful OCR software just once, and you'll never go back to retyping documents again.

Nobody likes wasting time typing letters, faxes and reports back into a word processor. That's why OmniPage® Pro Optical Character Recognition (OCR) software is so valuable to scanner users. It's faster and more accurate than even the fastest typist. ■ OmniPage Pro reads through each page, recognizing text in any font, from 6-point fine print to 72-point headlines. It intelligently analyzes the document for context and spelling, making smart decisions on hard-to-read characters. It's the most accurate OCR software yet. ■ Easily edit and format documents within OmniPage Pro, or in your favorite word processor. It's fully customizable, so you can tailor OmniPage Pro to your individual needs. Or train it to recognize special characters and symbols. You'll save lots of time and thousands of keystrokes. ■ Even the most complex layouts are no problem, because OmniPage Pro excels at handling both text and graphics on the same page. And it features Image Assistant,® an integrated 24-bit color image editor. ■ So try OmniPage Pro today and stop retyping.

OmniPage Pro offers great OCR accuracy with high-powered text and graphic capabilities.

TRADE UP

from your scanner's OCR software! Only

$149*

from any version of OmniPage, WordScan, or OmniScan SE, including the OCR bundled with your scanner.

Get these powerful new features:

- Increase accuracy with innovative neural network and Language Analyst™ technologies
- Easily edit graphics with fully-integrated, 24-bit color Image Assistant
- Improve recognition of hard-to-read documents with 3D OCR™ and customizable OCR training
- Recognize documents at your convenience with deferred processing
- Works quickly—it's Accelerated for Power Mac

*Suggested price

***Call 1-800-535-SCAN** ext. 80*

MW ★★★★ November 1994

MacUser ★★★★ January 1995

MacWEEK ◆◆◆◆ August 1994

OmniPage Pro.
Never retype another document.

caere

Caere, the Caere logo, Image Assistant, OmniScan and OmniPage are registered trademarks of Caere Corporation. 3D OCR and Language Analyst are trademarks of Caere Corporation. All other registered trademarks and trademarks are property of their respective companies.
© 1995 Caere Corporation. All rights reserved.

Circle 69 on reader service card

AnthroCarts®!

AnthroCarts will knock your socks off! Imagine how great it'll be when you find the perfect furniture for your equipment — just the right size, tough as nails construction and dozens of accessories.

And you'll find our service so real and responsive, you'll get a kick out of ordering direct!

Call for a free catalog!

Lifetime Warranty.

Adjustable for all sizes.

Lots of choices.

800-325-3841
6:00 AM to 6:00 PM PST, M-F
e-mail: sales@anthro.com

ANTHRO®

10450 SW Manhasset Drive
Tualatin Oregon 97062
Phone: (503)691-2556
Fax: (800)325-0045

GSA contract no. GS-OOF-5040A. Available for OEM applications. Prices from $159.00
Anthro, AnthroCart and Technology Furniture are registered trademarks of Anthro.

Macworld

DISPLAY ADVERTISING SALES

ACTING ASSOCIATE PUBLISHER	Suzanne Saluti (415/975-2624)
NATIONAL ACCOUNTS MANAGER	Lois Brennan (415/978-3262)
ACCOUNT EXECUTIVE	Liz Pabon (415/978-3257)
NATIONAL ACCOUNTS MANAGER	Marsha Bowers (415/978-3155)
ACCOUNT EXECUTIVE	Christine Wong (415/978-3192)
ADMINISTRATIVE ASSISTANT	Eva Bosch (415/974-7310)
NATIONAL ACCOUNTS MANAGER	Lianne Kirkland (714/250-1307)
ACCOUNT EXECUTIVE	Bethany A. Baller (415/978-3276)
ADMINISTRATIVE ASSISTANT	Martina Martin (714/250-1307)
NATIONAL ACCOUNTS MANAGER	Cynthia Ramsey (201/243-1197)
NATIONAL ACCOUNTS MANAGER	Paul Bonarrigo (508/872-8600)
ADMINISTRATIVE ASSISTANT	Alexandra Dileso (508/872-8600)
NATIONAL ACCOUNTS MANAGER	Lisa Ladle (800/779-5622)
ACCOUNT EXECUTIVE	Kathy Poppenhagen (708/827-4477)
ADMINISTRATIVE ASSISTANT	Kim Giovanni (708/827-4477)

MAIL ORDER/CLASSIFIED ADVERTISING SALES

DIRECTOR OF TELESALES OPERATIONS	Stephen R. Plevin (415/978-3138)
ACCOUNT MANAGERS/MAIL ORDER	Edward Ramirez (415/974-7413) Lisa Weisberg (415/978-3117)
MACWORLD SHOPPER	800/888-8622 Niki Stranz (415/978-3105), Carol Johnstone (415/978-3152), Shannon Smith (415/974-7414)
ADMINISTRATIVE ASSISTANT	Toni May (415/975-2638)

MACWORLD GLOBAL PRODUCT SUPPORT CENTER

DIRECTOR OF MARKETING AND COMMUNICATIONS	Kimberlee A. Luedee
TECHNICAL MANAGER	Chip Carman

MARKET RESEARCH

RESEARCH DIRECTOR	Linda Lawrence
SENIOR RESEARCH ANALYST	Jason Douglas
RESEARCH ANALYST	Matt McAlister

MARKETING

MARKETING DIRECTOR	Cynthia Koral
SENIOR MARKETING MANAGER	Jeff Julian
MARKETING MANAGER	Rhona Hamilton
TRADE SHOW/EVENTS COORDINATOR	Anna Noetzel
MARKETING ASSISTANT	Shannon McArdle

CIRCULATION

VICE PRESIDENT/DIRECTOR OF CIRCULATION	Angelina Beitia
SINGLE-COPY SALES DIRECTOR	George Clark
CIRCULATION MANAGERS	Lori Hitchcock, Elizabeth Jensen
NEWSSTAND SALES MANAGER	Martin Garchar
PROMOTION MANAGER	Kelvin Gee
NEWSSTAND COORDINATOR	Dalia Schwartz
SUBSCRIPTION COORDINATOR	Deirdre Dugan
CIRCULATION ASSISTANT	Eric Jue
SUBSCRIPTION INQUIRIES	800/288-6848

PRODUCTION

VICE PRESIDENT/DIRECTOR OF MANUFACTURING	Anne Foley
PRODUCTION MANAGER	Cynthia Mazzola
BILLING INFORMATION MANAGER	So Fong Yip
AD TRAFFIC COORDINATOR	Shellie Anderson
DTP COORDINATOR	Clayton Haberman
BILLING ASSISTANT	Lily Cheung

Explore the Internet FREE!*

There's something for everyone on the Internet. And now you can get full access to this incredible resource without risk. With ten FREE* evening and weekend hours on Delphi Internet.™

In 1992, Delphi Internet broke new ground by becoming the first major online service to offer full access to the Internet. Since then, Delphi Internet members have been at the forefront of the Internet revolution.

10 Hours FREE*

Delphi Internet connects you to 30 million people and 20,000 networks around the world. Send e-mail. Search online databases. Download free software. "Chat" with people who share your interests.

Never been online? Don't worry. Hundreds of expert online assistants are here to help you get started. You'll also enjoy free, unlimited phone support — all part of the most responsive customer support in the industry.

Over 850 local access numbers are available nationwide. So start your ten free* hours today. Call 1-800-695-4005. Or to join directly by modem, follow the instructions at right.

FREE*! InterNav™ for Windows.™ Join now and we'll send you, absolutely free, InterNav for Windows — the point-and-click software *Windows Magazine* says will "steer you into the fast lane of the information highway."

Coming Soon! Totally graphical user interface. To guarantee you easy access to the Internet's most exciting services, including the WWW, we'll soon introduce a new interface, featuring Netscape Navigator.™

Ten-hour Free* Trial!

For immediate access from any computer:
Dial by modem 1-800-365-4636. Press return until you get a prompt.
At Username, enter JOINDELPHI. At Password, enter MW795.

9,600 and 14,400 bps at no extra charge!

DELPHI INTERNET™
Questions? Call 1-800-695-4005

*Free offer applies to new members only. Limit one per household. Offer is valid for a limited time. A valid credit card is required for immediate access. Free time may be used only during the remainder of the calendar month of becoming a member. Telcom surcharges apply during business hours (6 a.m. to 6 p.m. weekdays) via Tymnet or SprintNet and for access outside the mainland U.S. New members must agree to Terms and Conditions of membership when joining. Complete details and other restrictions are provided during the toll-free registration. Delphi Internet and InterNav are trademarks of Delphi Internet Services Corporation. Netscape and Netscape Navigator are trademarks of Netscape Communications Corporation. Windows is a trademark of Microsoft Corporation. You must indicate during the online signup that you use Windows in order to receive InterNav software.

©1995 Delphi Internet Services Corporation

Circle 173 on reader service card

The Greatest Thing Since Sliced Bread

No matter how you slice it, our free Consumer Information Catalog is great food for thought.

The Catalog dishes up more than 200 free and low-cost government booklets on subjects you can really sink your teeth into — such as staying healthy, eating right, finding a job, getting federal benefits, using credit, buying a home, helping your kids, taking care of your car, and much, much more.

To get your free copy, send your name and address to:

Consumer Information Center
Department GT
Pueblo, Colorado 81009

A public service of this publication and the Consumer Information Center of the U.S. General Services Administration

Macworld

HOW TO CONTACT MACWORLD

SUBSCRIPTION QUESTIONS
Mainland USA 800/288-6848
fax 415/442-0766
All other locations 303/604-1465
or write Subscription Services
P.O. Box 54529
Boulder, CO 80322-4529

MACWORLD ONLINE
Contact *Macworld* editors directly via the Macworld areas on America Online and eWorld. On these services, readers can search current and past issues, exchange messages with editors and other readers, and attend live online events. Readers can also send electronic mail via CompuServe (70370,702), MCI Mail (294-8078), AppleLink (Macworld1), or the Internet (**macworld@macworld.com**).

MACWORLD IN MICROFORM
Macworld is available on microfilm and microfiche from UMI, 300 N. Zeeb Rd., Ann Arbor, MI 48106-1346; 313/761-4700.

BACK ISSUES OF MACWORLD
Write to Back Issues of *Macworld*, c/o Snyder Newell, Inc., P.O. Box 7046, San Francisco, CA 94120-9727; $6 per issue ($20 overseas). Prepayment in U.S. funds necessary. Make checks and money orders payable to Macworld Magazine.

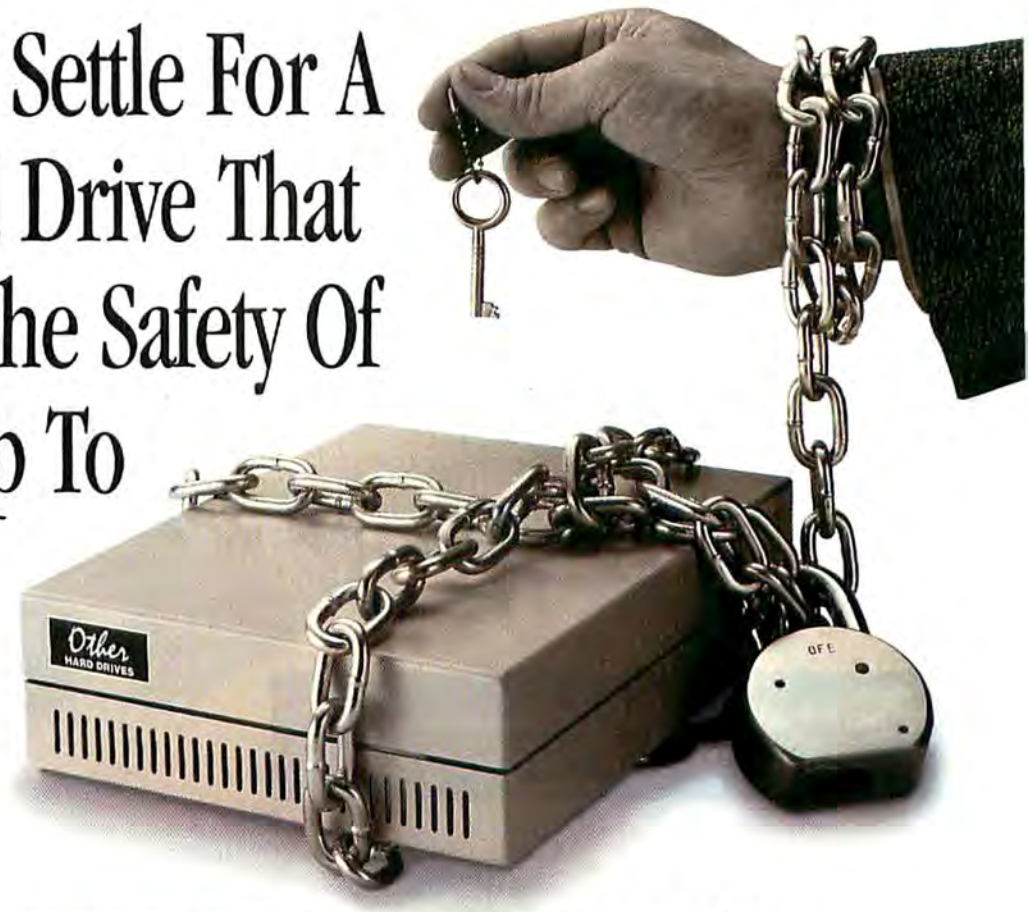
MACWORLD EDITORIAL
MAIL OR COURIER Macworld Communications, Editorial Dept., 5th floor, 501 Second St., San Francisco, CA 94107; 415/243-0505.
AppleLink: Macworld1
CompuServe: 70370,702 Fax: 415/442-0766
LETTERS TO THE EDITOR All written comments, questions, and suggestions regarding any aspect of the magazine are read by our editor. We reserve the right to edit all submissions; letters must include your name and address. Direct all correspondence (by mail or electronically) to Letters to the Editor.
QUESTIONS AND QUICK TIPS Direct questions or tips on how to use Mac computers, peripherals, or software (by mail or electronically) to *Quick Tips*, Lon Poole. Please include your name and address.
CONSUMER ADVOCATE Been burned? Really steamed? Direct your concerns (by mail or electronically) to *Conspicuous Consumer*, Deborah Branscum.
NEW PRODUCTS AND UPDATES Direct press releases and product announcements (by mail or electronically) and shrink-wrapped software upgrades (by mail or courier) to *New Products* Editor.
BUGS & TURKEYS Mail in descriptions of turkeys (flaws in conception or design) or bugs (defects or flaws in execution); copies of correspondence with vendor or telephone contact notes (if any); and your telephone number, mailing address, and T-shirt size.
STREETWISE SHOPPER To obtain an application for inclusion of special product promotions in *Streetwise Shopper*, vendors and resellers should contact Charles Barrett (by mail or electronically).
REPRINTS AND PHOTOCOPY PERMISSION Permission will be granted by the copyright owner for those registered with the Copyright Clearance Center (CCC) to photocopy any article herein—for personal or internal reference use *only*—for the flat fee of $1.50 per copy of the article or any part thereof. Specify ISSN 0741-8647 and send payment directly to the CCC at 27 Congress St., Salem, MA 01970. Address requests for reprint orders and for permission to copy editorial for other purposes to Reprints and Permissions, Editorial Dept.
WRITING FOR MACWORLD Do not send us unsolicited manuscripts. If you're interested in writing for *Macworld*, send a stamped, self-addressed envelope along with a request for our writer's guidelines. Direct (by mail) to Writer's Guidelines, Editorial Dept.

FOUNDER David Bunnell
FOUNDING EDITOR Andrew Fluegelman 1943–1985

Macworld is a publication of Macworld Communications, Inc. *Macworld* is an independent journal not affiliated with Apple Computer, Inc. *Macworld, Macworld Interactive, Macworld Shopper, MW, MW Lab, MW Shopper, Desktop Critic, Expert Graphics, Quick Tips, Star Ratings, Buyers Tools, Streetwise Shopper,* and *Conspicuous Consumer* are registered trademarks of International Data Group, Inc. *Power PC World* is a trademark of IDG, Inc. APPLE, the APPLE LOGO, MAC, and MACINTOSH are registered trademarks, and MACLETTER and POWERBOOK are trademarks of Apple Computer, Inc. Printed in the United States of America. Copyright © 1995 Macworld Communications, Inc. All rights reserved. *Macworld* is a member of IDG Communications, the world's largest publisher of computer-related information.

BPA IDG

Don't Settle For A Hard Drive That Leaves The Safety Of Your Data Up To Your Own Devices.



Joule Drives Set A New Standard Of Data Safety With SmartDock™ And Interchangeable Modules

We've devised a revolutionary hard drive that lets you protect your valuable data the same way you protect your jewelry, your cash and your credit cards. Store it. Secure it. Or carry it with you.

Joule's compact modules give you the freedom to safely store or transport your data with ease. Like a diskette, only bigger... and faster. Thanks to Joule's exclusive SmartDock technology, files up to 4300MB can be unplugged and secured in an instant without cables or SCSI hassles. So your private files stay private as they move safely with you. Down the hall. Around town. Or around the world.

Unlike other hard drives, SmartDock's detachable circuitry eliminates data safety concerns from power supply failures. Only La Cie offers no-risk, same-day power supply replacement. With a phone call and without returning your drive, we will swap your drive's power supply and controller circuitry in 24 hours under our DataSafe™ program. This exclusive service comes standard along with toll-free technical support and solid Quantum drive warranties up to 5 years long.

Don't settle for less than the most complete hard drive protection plan ever devised. Discover SmartDock. Engineered data protection only from La Cie Ltd., a Quantum Company. The leader in hard drives for Macintosh.

Joule Serves You Better.

LACIE LIMITED
A QUANTUM COMPANY

1-800-999-1488

Mon.– Fri. 5AM-7PM & Sat. 8AM-NOON PST
International 503-520-9000 Fax 503-520-9100 (24 hrs.)
UK 0800-89-3025 Australia 0014-800-123-007

It's About Time You Expected More From Your Storage System...

Expect Portability, Safety And A Cordless Path To Future Growth...But Don't Expect To Pay More

With the creation of Joule Modular Storage, we've reinvented the "ins and outs" of data storage to create a system that serves you better. Joule's exclusive SmartDock™ technology gives every Joule drive freedom from its power supply and cable connections.

More Portable

This makes Joule Drives smaller and more portable, so your data and your drives can be more easily shared or secured. And with Joule's unique modular stacking system, you're assured of a built-in path to future growth, so your Joule Drive never becomes obsolete.

More Compact

MORE WAYS TO BEGIN

Joule lets you enter the world of modular storage with a portable hard drive or a removable drive module. Modules can plug into a SmartDock for stand-alone use, or when you're ready to grow, can plug into a stack. The SmartDock then becomes your link between any other Joule modules and the world!

If you've got a stack in your future, begin with a Joule Base Drive. Available in hard disk, optical or SyQuest drives, your base will support an entire stack with universal power supply, surge protection, auxiliary outlets, and more.

MORE WAYS TO GO AND GROW

Unlike other "stackable" systems, Joule's unique system of cordless plug and play modules features an ingenious vertebrae-like support structure and active termination to give you the freedom to move, remove, add or interchange modules instantly without cable or SCSI hassles.

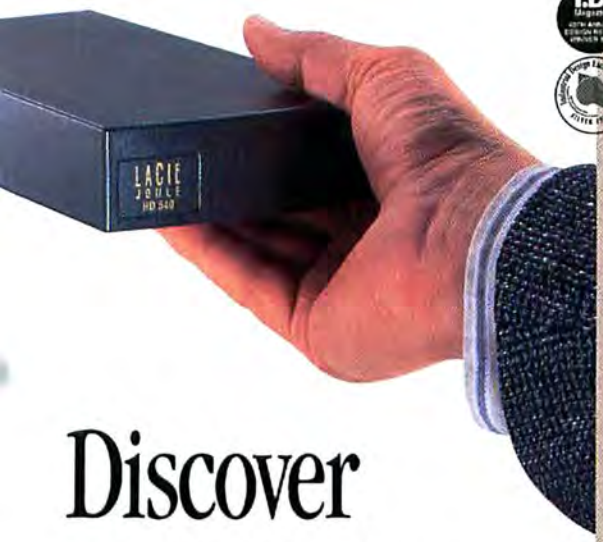
Less Cable Clutter

30 Day Money Back Guarantee*

MAC HOME JOURNAL

Silverlining™ FREE with La Cie Drives!

Ready to Plug And Play



Discover Joule Drives.

With Joule you can combine up to six storage devices without the clutter of external cords or connecting hardware. Joule is even available in award-winning RAID systems!

START WITH CONFIDENCE

Joule Drives give you more reasons to feel confident in your purchase too. Reasons like solid Quantum drives with warranties up to 5 years, and toll-free support. Plus our exclusive DataSafe™ repair program that promises 24 hour power supply replacement without returning your drive. Every Joule drive includes a SmartDock with external cables, Silverlining™ hard disk management software and LaCie's own La Cie Term™ digital active SCSI termination.

Now that you can have a storage system that offers so much yet costs no more, we expect you won't settle for less.

Joule Serves You Better.

Circle 52 on reader service card

Joule Hard Drives

Joule Portable 730MB Hard Drive $349

	INTERNAL†	PORTABLE w/ DOCK

3.5" Hard Drives

Quantum – 2 or 5 year warranties

270MB	$159	$249
365MB	$169	$259
540MB	$219	$299*
730MB	$249	$349*
1080MB	$579	$649*

* These drives are also available in Joule Base configurations for an additional $60.

† Brackets available for $10 with HD purchase

Brand New Quantum Drives – Call For Prices
420MB Trailblazer
850MB Trailblazer
1080MB Fireball

	INTERNAL DRIVE	TSUNAMI CASE

3.5" Tsunami Hard Drives

Quantum – 5 year warranty

2100MB	$939	$1049
4300MB	$1489	$1599

2.5" Hard Drives

Quantum – 2 year warranty

256MB	$239	$329
341MB	$289	$379
514MB	$389	$479

Joule Removable Drives

Joule Portable SyQuest 270MB $489 With FREE Cartridge

	INTERNAL w/ BRACKET	PORTABLE w/ DOCK	INTERNAL w/ BRACKET	PORTABLE w/ DOCK

230MB Fujitsu Optical Drive

$629 $699*

With Free 3.5" Cartridge - 1 Yr Warranty

SyQuest Drives

With 1 Free Cartridge - 1 Year Warranty

105MB	$299	$369*
270MB	$419	$489*
88MB†	$369	
200MB†	$439	

† 88MB & 200 MB SyQuest Drive available in Zero Footprint and internal versions only. Add $60 for Zero Footprint case configuration.

* These drives are also available in Joule Base configurations for an additional $60.

600MB Tape Drive

$579 $649

Includes 1 Free Tape Cartridge & Retrospect™ – 1 Year Warranty

8.0GB DAT Tape Drive

$929 $999

Includes 1 Free Tape Cartridge & Retrospect™ – 1 Year Warranty

Removable Cartridges

SyQuest:	44MB	$49	88MB	$59
	200MB	$89	105MB	$59
	270MB	$69		
Optical:	230MB	$49		

Joule RAID

Configured With Levels RAID-0, RAID-1, RAID-4, RAID-5.

2.0GB	$1599	8.4GB	$4499
4.2GB	$2699	16.8GB	$8999

Silverscanner III

Package 1 $1499
Color It!, Read-It Pro OCR & Silverscan

Package 2 $1799
Photoshop, Read-It Pro OCR & Silverscan

Transparency Adapter $799
Sheet Feed Adapter $499

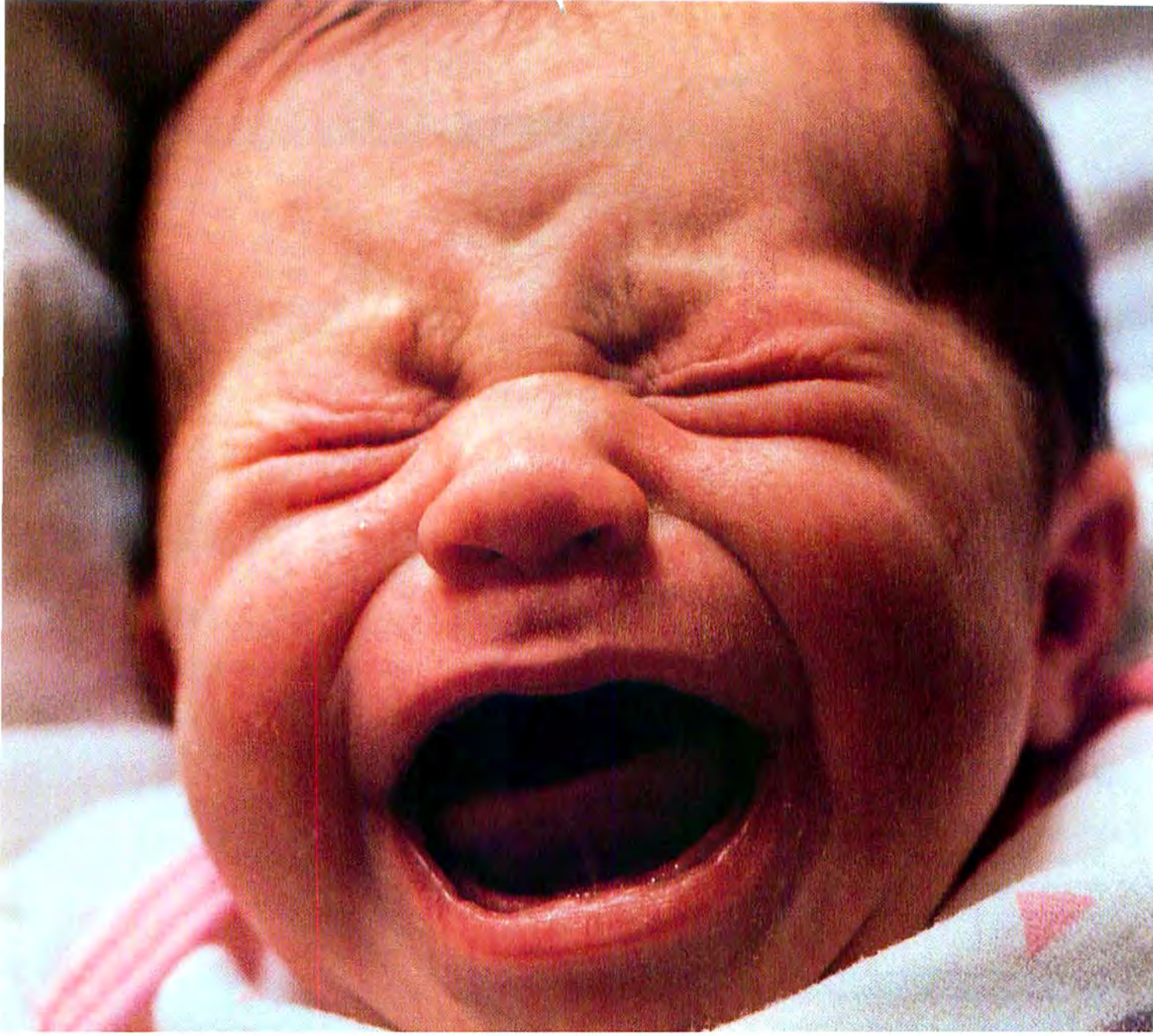
***New!* Silverscanner DTP**
Photoshop LE, Read-It Pro OCR & Silverscan $999

LACIE LIMITED
A QUANTUM COMPANY

1-800-999-1488

Mon.– Fri. 5AM-7PM & Sat. 8AM-NOON PST
International 503-520-9000 Fax 503-520-9100 (24 hrs.)
UK 0800-89-3025 Australia 0014-800-123-007

* Call for details, conditions, limited money back guarantee, and free offers. Prices do not include shipping and only apply to products shipped within the continental United States. Add sales tax where applicable. Joule, Joule Portable, La Cie Term, DataSafe, Silverlining, La Cie and the La Cie logo are trademarks of La Cie, Ltd., a Quantum Company. All other trademarks are the property of their respective companies. All prices, specifications, terms, warranties, descriptions, products and services herein are subject to change without notice or without recourse. © Copyright 1995 La Cie, Ltd. All rights reserved.



"But I Thought My New Macintosh Would Run Windows Applications."

There's no need for tears. You thought your new Mac could run Windows applications right out of the box, but it doesn't. No problem. Just get SoftWindows and run thousands of Windows applications on Mac.

SoftWindows lets you run the DOS and standard mode Windows applications you need at work or at home. With a couple of clicks, you can run databases in Access. Edit spreadsheets from Excel or Lotus 1-2-3. Exchange documents, presentations, even access your company's e-mail, printers and networks.

FREE UPGRADE!
BUY SOFTWINDOWS FOR POWER MAC 1.0 AND GET 2.0 FREE!
Look for details on the package at your local reseller

Over 150,000 Mac, Power Mac and Performa users already run Windows applications with SoftWindows. So can you. Just look for our "Try-It" CD-ROM at your favorite retailer and test it for 30 days risk-free. You'll see. It's as easy as taking candy from a baby.

See your local dealer or call 1-800-848-7677.

MICROSOFT® WINDOWS™ COMPATIBLE
Includes Microsoft Windows 3.1 and MS-DOS 6.21

SoftWindows™
Run Windows On Mac

INSIGNIA SOLUTIONS

© 1996 Insignia Solutions Inc., Mountain View, CA • Phone (415)335-7100 • Fax (415)335-7105. Insignia and Insignia Solutions are registered trademarks of Insignia Solutions Inc. SoftWindows is a trademark used under license. Windows is a trademark and MS-DOS is a registered trademark of Microsoft Corporation. All other trademarks are the property of their respective holders.

Circle 68 on reader service card

BY ADRIAN MELLO

Map to the Future

A field guide to the technologies transforming the Mac

ONLY A YEAR SINCE THE MOST dramatic change to the Mac's architecture—the switch to the potent PowerPC microprocessor family—and already the ground is again changing underfoot. How's a Macintosh user supposed to stay current? How do you keep from losing your bearings when the path to the Mac's new greener pastures is marked by terms such as *Copland*, *Gershwin*, *clones*, *CHRP*, *PCI*, *OpenDoc*, *QuickTime VR*, and *QuickDraw 3D?* If you're befuddled by all this change, you're not alone. To help guide you through, here's a sketch map of the new topography—showing the benefits and expected arrival dates of these developments. For deeper insights into the new technologies, I recommend some related articles from *Macworld*'s in-depth advance coverage.

Milestone 1: Clones

In the event that you've been in Antarctica and missed hearing about Mac clones, here's a quick review. A Mac clone is a computer produced and sold by a company other than Apple that can nonetheless use the Mac Operating System and the many applications written for it. Clones are now possible because, after ten years of going it alone, Apple finally decided to license the Mac Operating System. The first clones are here now, although initially there will be clones from only a few companies, including DayStar Digital, Power Computing, and Radius. Power Computing hopes to license its clone technology to other developers as early as this year. You can expect to see many more units down the line, but not until Apple licenses the Mac OS to a major computer maker like IBM, Dell, or Acer. (For more on clones, see the April 1995 *Macworld*.)

The presence of Mac clones signals more choice for Macintosh users. You will be able to buy Mac-compatible computers from companies offering different combinations of features for different prices. You might, for example, buy a less expensive (if perhaps less elegantly designed) alternative to the Mac, or pay somewhat more for a clone configured to meet your special requirements. And you'll be able to buy clones through the mail or from a company that is set up to support your particular application or organization. Choice is great, but consumers will need to be even better informed than before to make the right choice. That's where we come in. Stay tuned as Macworld Lab tests and reviews each clone as it hits the market.

Milestone 2: QuickTime VR and QuickDraw 3D

The Mac's next landmarks are the recently announced twin media technologies, QuickTime VR and QuickDraw 3D. QuickTime VR is a tool that lets developers create realistic virtual environments for users to explore, in which you make real-time decisions as if you were walking around inside an actual building, national park, starship, or human circulatory system. QuickTime VR will usher in a new class of CD-ROM titles that are more engaging than what's currently available—ones that virtually set you inside your own interactive movie.

At this writing Apple was readying to release the developers' tool kit that will make QuickTime VR–based CD titles possible. The only cloud over this happy scene is that Apple is charging developers an arm and a leg to use it; that may discourage adoption and slow the release of titles. That would be a real shame and a disservice to consumers, because once you see a nice QuickTime VR application, you'll never want to go back to regular CD-ROMs. (See the feature story "VR: QuickTime's New Edge," in this issue.)

We now take for granted the ability to cut and paste graphics between applications. Apple made this possible when it introduced the PICT file format with the original QuickDraw. But PICT works with two-dimensional graphic images only. QuickDraw 3D will enable you to transfer 3-D images between applications through a new, 3-D Clipboard. Editable 3-D imagery may soon be as common as 2-D graphics, giving Mac applications a new dimension (although most interface designers aren't convinced that they can in the near term create 3-D interfaces that add much value). Users should be able to get hold of QuickDraw 3D by the end of summer. After that it will be included on new Macs and be rolled into the next system software update. (For more on QuickDraw 3D, see *News*, May 1995.)

Milestone 3: PCI

You know how trash collectors are sometimes called sanitation engineers? Welcome to PCI, for Peripheral Component Interface—a highfalutin way to say "expansion bus." The next generation of Power Macs, purportedly due sometime this summer, uses PCI instead of NuBus, the Mac's primary bus standard since 1987. PCI slots require PCI cards, so when you go to buy an add-in card, take care that you don't accidentally purchase a NuBus card.

PCI is potentially two to three times as fast as NuBus, which could speed up

continues

DON ARDAY

applications such as 24-bit video, motion-video editing and playback, network transfer, and Internet access. The other advantage to PCI is that many PCs also use it; this may lead to lower costs and greater choice. (See the feature story "Why PCI," June 1995.)

Ah, if only it were that easy. Some vendors may have to adapt their PCI cards for the Mac to achieve optimum performance. This could translate to extra cost for customers, who, instead of being able to swap PCI cards between their Mac and PC, might end up having to buy different versions. Some vendors have already committed to making PCI cards for the Mac, but many are taking a wait-and-see attitude. If you buy a PCI-only Mac, your add-in choices may be limited until more vendors commit. You may also face problems if you want to transfer any of your NuBus cards to a Mac that supports only PCI. Fortunately, some companies have foreseen this complication. Second Wave has announced Xpanse, a NuBus expansion chassis that will attach to your new PCI machine to let you use your old cards. And I won't be surprised if some enterprising clone maker offers a computer with slots for both NuBus and PCI.

Circle 50 on reader service card

Milestone 4: OpenDoc

If you're tired of switching from program to program just to complete work that ends up in a single document, OpenDoc may be for you. Currently, to produce a typical report, you write up the text narrative in a word processor, switch to a spreadsheet to prepare your charts, then draw a diagram in a draw package, and finally copy and paste all these pieces into a page-layout program to produce the final document.

OpenDoc takes a "document-centric" approach, letting you focus on the project as a whole, rather than on its component parts. When you work on a given element, OpenDoc automatically provides the appropriate menus and tools. In addition to simplifying the project from a user's point of view, this approach permits developers to focus on fine-tuning tools for specific purposes, rather than loading up their applications with redundant features that are better supported elsewhere. The anticipated result will be lower-cost tools that collectively make more efficient use of system resources such as RAM and storage capacity. To work within this document-based scheme, you will still need to have the appropriate tools assembled on your system and be sure that they support OpenDoc. Many developers are enthusiastically revising their applications to work with OpenDoc, but as is typical with new technology, others are taking a more conservative approach. In any case, OpenDoc won't ship until early 1996. (See the feature story "OpenDoc and OLE 2.0," November 1994.)

Milestone 5: Converged Platform

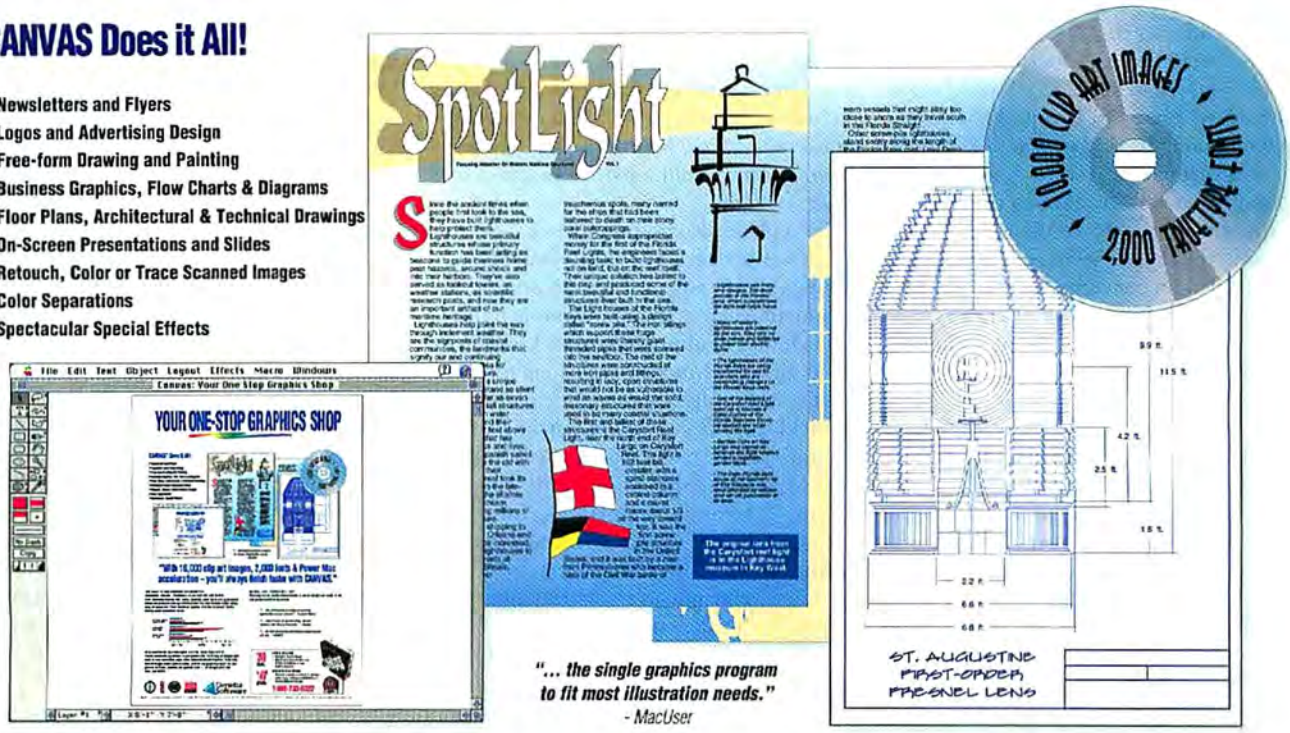
It could be called the second coming of the clones, but for now it's technically referred to as the Common Hardware Reference Platform, or more simply, the converged platform. This specification—jointly developed by Apple, IBM, and Motorola—severs the previously indivisible bond between a given hardware design and its target operating system. In the converged-platform future, you will be able to buy a computer that can be easily configured to run under various operating systems, including the Mac OS, NetWare, OS/2, Solaris, AIX, and Windows NT. The first Macs released in this environment may require a Mac-specific

continues

YOUR ONE-STOP GRAPHICS SHOP

CANVAS Does it All!

- Newsletters and Flyers
- Logos and Advertising Design
- Free-form Drawing and Painting
- Business Graphics, Flow Charts & Diagrams
- Floor Plans, Architectural & Technical Drawings
- On-Screen Presentations and Slides
- Retouch, Color or Trace Scanned Images
- Color Separations
- Spectacular Special Effects

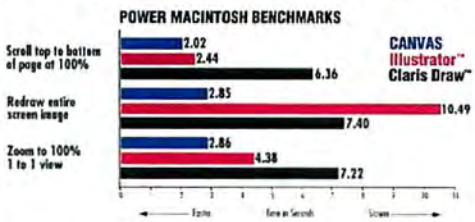


"... the single graphics program to fit most illustration needs."
- MacUser

"With CANVAS™, 10,000 clip art images, 2,000 fonts and Power Mac™ acceleration, you'll always finish first."

THE EASY-TO-USE DRAWING PROGRAM FOR BUSINESS, DESIGN, TECHNICAL ILLUSTRATION AND MORE!

Canvas gives you the power to complete any graphics project without bouncing around between half a dozen applications. With its award-winning, intuitive interface, Canvas lets you draw, layout, paint, present, apply a multitude of sophisticated special effects — and take your work all the way to finished film.



EXCLUSIVE NEW CD-ROM JUMP STARTS YOUR CREATIVITY

Canvas comes with a premium CD jam-packed with 10,000 clip art images ready-made for your newsletters, signs, sales presentations and diagrams. These fully editable images make a perfect starting point for any graphics project! You also get over 2,000 professional TrueType™ text, display and novelty fonts — more than any other package at any price!

SO WHAT ARE YOU WAITING FOR?

Run today to your favorite software retailer or call us and get your hands on the best graphics software buy around.

"... the best object-oriented drawing program money can buy." - MacWEEK

"... this multi-purpose drawing and painting application is power-packed." - Computer Pictures

"... when it comes to text-handling, Canvas' features rival those of Illustrator." - MacUser

Accelerated for Power Macintosh

$269 Estimated Street Price

$149.95 Competitive Upgrade Price

CANVAS INCLUDES

- Unlimited Free Technical Support
- 60-Day, Risk-Free Money-Back Guarantee
- CD-ROM with 10,000 clip art images & 2,000 TrueType Fonts

COMPETITIVE UPGRADE

- Simply show us proof of ownership of any Macintosh graphics program and chop nearly $250 off Canvas' already low $399 price! Call today...

1-800-733-6322

60 DAY MONEY BACK GUARANTEE RISK-FREE!

MACWORLD MW EDITORS' CHOICE

Deneba Software

©1994 Deneba Systems, Inc. Canvas is a trademark of Deneba Software. All other trademarks are the property of their respective owners. Offer valid in the United States and Canada and is subject to termination or change without notice. This offer is not valid with any other promotion or offer.

Circle 57 on reader service card

ROM, but later versions will probably not need any special hardware.

The converged platform promises some enticing benefits. Users will be able to change their machine's identity simply by installing a different operating system. In complex workplaces the ability to easily support several platforms will make a world of difference. Because more computer vendors will presumably be using many of the same components, there may be economies of scale that would make converged-platform computers cheaper to buy, maintain, and upgrade.

Unfortunately, a converged-platform computer capable of running the Mac OS is still a far piece down the road. Expect to wait until late 1996—as much as a year later than converged-platform products running competing operating systems, chief among them being Windows NT, hit the streets. (See "Mac Hybrids," April 1995.)

The Road Ahead: Copland, Gershwin, and Beyond

The next major version of the Mac's system software, code-named Copland, is at least a year away (and be forewarned, operating systems are notorious for missing their planned ship dates). Copland will be the first Mac OS to require the PowerPC chip, at least at its introduction; a 680X0-based version looks doubtful and would certainly be developed after the Power Mac version, if at all.

While you await Copland's arrival, it's interesting to note what Copland will do for you. Most significant to the user, Copland should run software faster, use resources more efficiently, and crash less often. You might also pass the time boning up on a cascade of technical terms related to the several architectural improvements that make Copland's achievements possible, such as *preemptive multitasking*, *multithreading*, *demand-paged memory*, and a *hardware abstraction layer*, or *HAL*.

Copland also noticeably enhances the Mac's interface, enabling you to customize many aspects of your work environment, such as menus, window frames, and views. An improved Apple Guide will help automate more operations for you, and system software components such as QuickDraw GX that you currently now acquire and install optionally will be built in, so more applications will support them. Although Copland's interface shows some of Apple's famed creative whimsy, the operating system's real promise rests not in its whizzy new features, but in the substantive value it will bring users in the daily operation of their Macs. (See the feature stories "The New Mac OS Unveiled" and "The Mac's Jazzy New Face," both in this issue.)

Beyond Copland lies a version of the Mac OS called Gershwin, about which it's too early to say much except that it will continue to extend the depth of memory protection and multitasking introduced in Copland for even greater functionality and stability.

Beyond the Horizon

Even industry insiders and the most assiduous trend-watchers will tell you that to forecast the Macintosh's future much beyond a one- or two-year horizon is a dicey business. Not only does the technology develop far too rapidly to predict with confidence, but factor in the uncertainties of the business world, and all bets are off. What is clear is that Apple seems to be striving to achieve a more sensible balance between the dazzle of new technology and its pragmatic application. The synergy among these new technologies will lead to faster Macs capable of increasingly impressive graphics, as well as to cross-platform utility that may make it easier than ever to have and use a Mac in mixed environments. This new course that Apple is charting appears destined to benefit developers and users like us in tangible ways. And it's certain to be interesting. **m**

Some people donate money to keep the air clean. Jeff Angus wrote 2000 lines of code.

Jeff Angus has regularly donated money to the Natural Resources Defense Council. Now he also supports them in a different and maybe even more valuable way. By donating his skills to modify a dBASE program that generates customized reports about toxic substances.

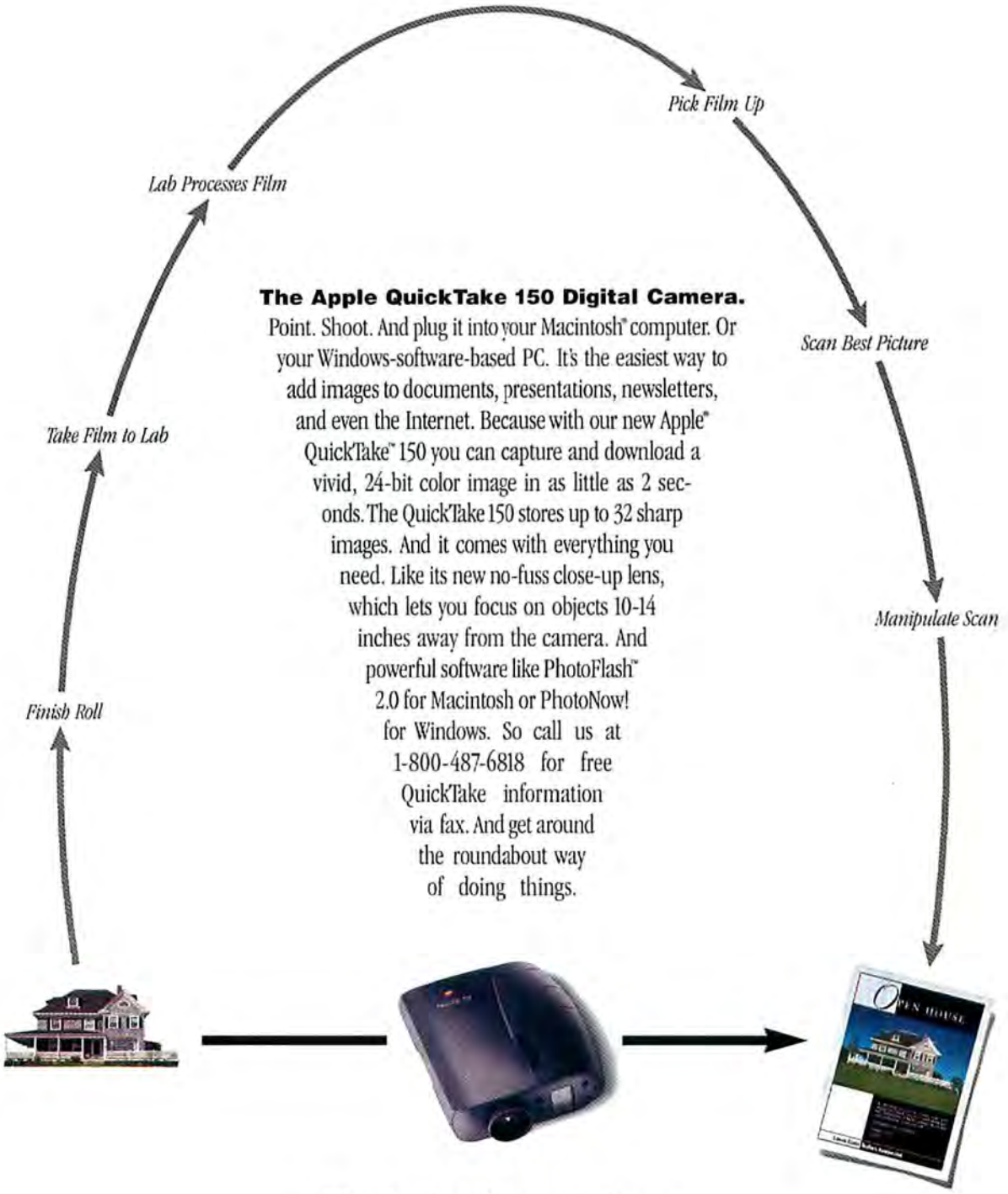
© 1991 CompuMentor

If you'd like to put your own special skills to good use, call 1-800-659-3579. And we'll match you with a local non-profit organization whose needs are compatible with your area of expertise. Call us now, and we'll show you a great way to make a real difference in the world. By doing what you do best.

CompuMentor®

People helping computers help people.

89 Stillman Street, San Francisco, CA 94107



The Apple QuickTake 150 Digital Camera.

Point. Shoot. And plug it into your Macintosh® computer. Or your Windows-software-based PC. It's the easiest way to add images to documents, presentations, newsletters, and even the Internet. Because with our new Apple® QuickTake™ 150 you can capture and download a vivid, 24-bit color image in as little as 2 seconds. The QuickTake 150 stores up to 32 sharp images. And it comes with everything you need. Like its new no-fuss close-up lens, which lets you focus on objects 10-14 inches away from the camera. And powerful software like PhotoFlash™ 2.0 for Macintosh or PhotoNow! for Windows. So call us at 1-800-487-6818 for free QuickTake information via fax. And get around the roundabout way of doing things.

The shortest distance between two points remains a straight line.

Apple

Mac OS For Windows

Image on document shown at 7.17" x 5". For more information and sample images you can download, stop by our World Wide Web server at http://www.apple.com. ©1995 Apple Computer, Inc. All rights reserved. Apple, the Apple logo and Macintosh are registered trademarks of Apple Computer, Inc. Mac, the Mac OS logo, PhotoFlash and QuickTake are trademarks of Apple Computer, Inc. All Apple products are designed to be accessible to individuals with disability. To learn more (U.S. only), call 800-776-2333 or TDD 800-833-6223.

OUR COLOR

But the features that come with it will.
Now QMS can add color and life to your documents for just $4,999.

LASER PRICE

The QMS *magicolor*® LX Laser Printer—high resolution text output and automatic color optimization that make your documents as professional as you are.

WON'T BLOW

Plus, CrownNet™ multiplatform connectivity and Crown® multitasking technology increase your productivity without sacrificing quality.

YOU AWAY.

For a difference you can see, at a price you can afford,
call ***800 392-7559*** Dept. ***5044*** today.

QMS

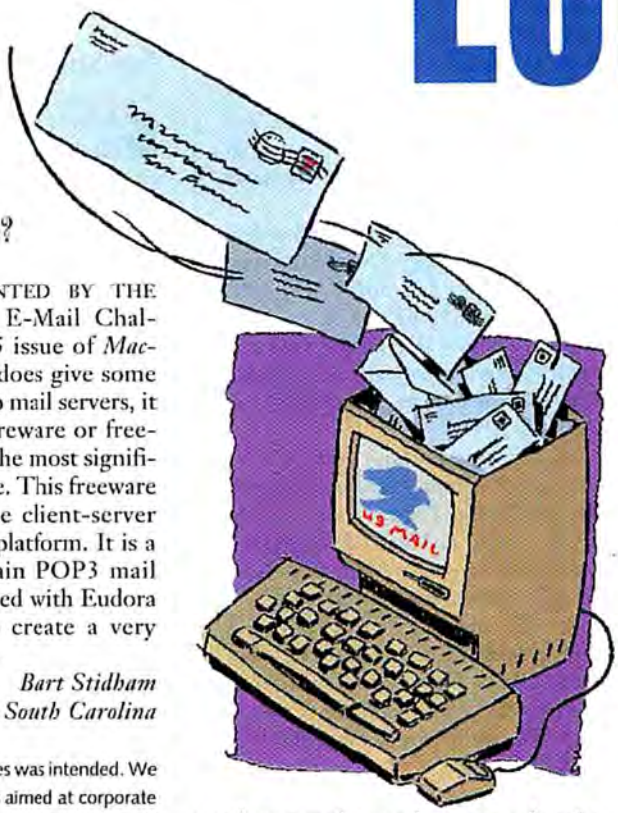
Outperform The Very Best.

For service on QMS or other products, call 800 762-8894 (U.S.) • Q-Fax 800 633-7213 • Canada 800 263-5508

QMS, the QMS logo, *magicolor*, CrownNet and Crown are trademarks or registered trademarks of QMS, Inc. One Magnum Pass, Mobile, AL 36618, 334 633-4300.

JULY 1995

Letters



What? No Freeware?

I WAS VERY DISAPPOINTED BY THE article "Meeting the E-Mail Challenge" in the April 1995 issue of *Macworld*. While the article does give some valuable tips on setting up mail servers, it fails to mention any shareware or freeware programs. Perhaps the most significant omission is Mailshare. This freeware program is the only true client-server mail system on the Mac platform. It is a port of the public-domain POP3 mail server and can be combined with Eudora 1.5.1 (also freeware) to create a very robust system, at no cost.

Bart Stidham
Columbia, South Carolina

No slight to shareware alternatives was intended. We deliberately focused on products aimed at corporate users interested in building large, complex E-mail networks. Since business users typically want the support that comes with commercial products, we left shareware and freeware E-mail solutions for another time.—Ed.

Questionable Loyalty

THE RECENT COLUMN BY ADRIAN Mello ("Cloning Opportunities," *State of the Mac*, April 1995) suggests that it will be difficult for clone makers to compete against Apple's "formidable customer loyalty." He then notes problems with Apple upgrades and take-it-or-leave-it systems. I suspect that Mac enthusiasts are loyal to the Mac Operating System and the wonderful software available—not to Apple.

Gary B. Weiss
Webster, Texas

Special Delivery 2.0

YOUR REVIEW OF SPECIAL DELIVERY 2.0 (April 1995) left us disappointed and confused. The review starts off with a rather complete and accurate description of the product. The reviewer then talks about his students' experiencing occasional inconsistent behavior and system crashes, which he acknowledges he couldn't reproduce, and then says he found more glitches than he would expect in a version 2.0 product.

We were never contacted by either the students or the reviewer to find out why they were having problems, and if, in fact, the problems were attributable to Special Delivery.

We have thousands of satisfied users who have not experienced glitches or random crashes. In fact, Apple test engineers tested and approved the Special Delivery demo that shipped with the Quadra 630.

Peter Rosenthal
Interactive Media
Los Altos, California

Overture, Schmoverture

IN A REVIEW OF OVERTURE (APRIL 1995), you refer to several competing music-notation programs but fail to mention the one I consider the best of all, Nightingale. As a professional musician and composer, I find Nightingale has all the capability I need in a music-notation program. A complementary program, NoteScan, reads printed music with a scanner and converts it to a document editable in Nightingale. I hope you give attention to these programs in the near future.

Abram Plum
Bloomington, Illinois

Readers can see for themselves by contacting Tap Music Systems at 206/462-1007 and asking for a demo copy of Nightingale ($10), or by downloading it free from CompuServe (**Go Midibren**), America Online (keyword **MMS**), or **sumex** or **umich** Internet sites.—Ed.

Microsoft Library 1.0

THANK YOU FOR PUBLISHING GUY Kawasaki's open letter to Bill Gates in the April 1995 issue of *Macworld* (*Wise Guy*). Bill Gates would be a national hero if he came to the rescue of our crumbling intellectual heritage, especially at the very time the National Endowment for the Humanities, which has done so much for the cause of preservation, is under attack.

The Council on Library Resources was formed in 1956 to assist libraries in finding cooperative solutions to their big problems: automation and preservation. Since then, the council has sponsored dozens of research and demonstration projects in libraries.

In 1986 a number of libraries and scholarly organizations banded together to concentrate on preservation. The Commission on Preservation and Access, for the last nine years, has been acting on behalf of the nation's libraries, archives, and universities to develop and encourage collaborative strategies for preserving and providing access to the accumulated record.

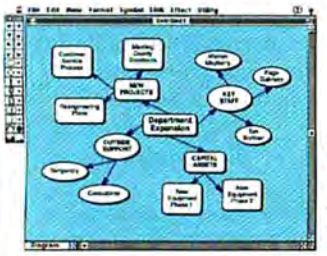
Both of these nonprofit organizations have small staffs who are leveraging a rel-

continues

WARD SCHUMAKER

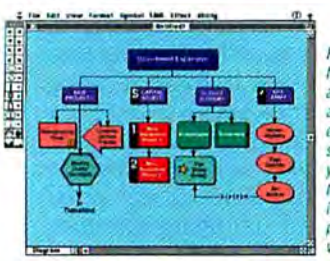
Instantly Visualize Concepts...

Getting started is often the most difficult part of clarifying an idea or developing a plan or concept. The next time you begin to work use Inspiration®—the real-time idea development tool for clarifying and organizing your thoughts.



Instantly Rapid-Fire™ out your ideas and see your thinking take form.

At any time, flip to Inspiration's fully integrated Outline View to further organize and write.



Powerful features such as auto-arrange and over 500 symbols help you quickly transform ideas into fine presentation visuals.

Call (800) 877-4292 for your
FREE IDEA BOOK

Inspiration®

Inspiration Software®, Inc.
503.245.9011 Tel. • 503.246.4292 Fax

©1995 Inspiration Software®, Inc.

CORRECTIONS

- *MailHub from Control Data Systems does indeed support cc:Mail ("Meeting the E-Mail Challenge," April 1995).*
- *Wolfram Research's Optica 1.0 is an add-on module for Mathematica, not a stand-alone application* (Power Mac News, *May 1995).*
- *We incorrectly stated that Adobe Dimensions doesn't render in the background* (Reviews, *April 1995). Users may switch, via a Preferences option, to other programs while Dimensions renders in the background.*
- *The correct phone and fax numbers for Mirror Technology* (New Products, *April 1995) are 612/830-1549, 800/654-5294; fax 612/633-3136.*
- *The correct Web site for TidBits is* **http://www.dartmouth.edu/pages/TidBITS/TidBITS.html** (Macworld Online, *May 1995).*
- *The PaperPort is a 200-dpi scanner, not 300-dpi as reported* (Reviews, *May 1995). Also, Visioneer offers E-mail links for Lotus cc:Mail, CE Software's QuickMail, Microsoft Mail, and Apple PowerTalk through a $49 upgrade.*
- *The author of Peter's Player 1.1* (The Desktop Critic, *April 1995) has moved. Peter Lee's current address is 3 Strippe Rd., Haydenville, MA 01039-9605. The shareware fee is still a disk and $20.*
- *The word processor included in ClienTrac 2.0* (Reviews, *May 1995) is capable of multiple-page documents.* Macworld *regrets the error.*

atively small amount of money to do the task Guy Kawasaki outlines. We welcome assistance from Mr. Gates and all others who agree that preservation of what society has thought and learned is important.

Deanna Marcum
President, Council on Library Resources, and Commission on Preservation and Access
Washington, D.C.

Phaser Praiser

YOUR REVIEW IN THE APRIL 1995 ISsue of *Macworld* comparing Apple's Color StyleWriter 2400 with Tektronix's Phaser 140 printer does not stress the fact that the Mac to which the printer is connected is rendered basically useless while printing from a Color StyleWriter 2400. I feel Tektronix has done an outstanding job of bringing to market a low-cost, high-quality printer with an internal processor. Your chart should also have noted the speed difference if the user does purchase the Ethernet upgrade as well as additional RAM. A comparison with the Color StyleWriter Pro on the graph would have been nice, too.

Andy Knasinski
Glendale, Wisconsin

Newton Natives Restless

STEVEN LEVY'S APRIL 1995 *THE ICONOclast* column, "The Palmtop Blues," contained a statement that will probably cause me not to send in my early renewal. The statement was "Now, Palm Computing, maker of a Newton program called Graffiti, asserts that its product will allow you to flawlessly input text into the device. But Graffiti requires you to alter the way you print, writing some letters in weird, neo-hieroglyphic fashion. In other words, change the way you write. Sorry. I have a near-religious belief that machines should adjust themselves to my behavior and not the other way around." When you started typing on a keyboard you changed the way you wrote to adjust to a machine. It took me about two days to become proficient using Graffiti. How long does it take a person to become proficient at typing?

I received my copy of Graffiti a few days before receiving the April issue of *Macworld* and can only describe your dismissal of this great program as the height of hubris. Graffiti is based on the concept that it will recognize any letter the instant you lift your pen. Believe it or not, it does so with nearly 100 percent accuracy. This requires that a few letters contain only a part of the letter since to complete the letter would take more than one stroke.

Graffiti changed my Newton from a toy to a computer. Apple should bundle it with the Newton until they can get it in ROM. It is that good. You owe it to your subscribers to have a complete review of Graffiti as soon as possible.

Arthur Price
Tulsa, Oklahoma

We're one step ahead of you, Arthur—we gave Graffiti a very respectable four-star review in our May 1995 issue.—Ed.

NORMALLY, I HAVE LEARNED TO ignore most of the (not always) good-natured ribbing about the Newton, but *The Iconoclast* is either an April Fools' prank to pull my chain, or Mr. Levy has his back turned to the PDA vertical market.

For the last eight months, I have used

continues

STORE ALL YOUR DATA ON RECORDABLE CDs!

#1 SELLING RECORDABLE CD SYSTEM

ONLY $1695

Backup on CD! Or Create a CD of Data, Video, or Audio

Macintosh Backup Utility

USES

1. Store graphics for only 3 cents per megabyte.
2. Create data, video, audio CDs.
3. Backup accounting records, business plans, charts, graphs or confidential information.
4. Great for low-volume distribution of data - only $19 per disk.
5. Ship RCD media anywhere for next-day delivery.

PROS

1. Affordable complete system.
2. Inexpensive RCD media.
3. Easy-to-use software.
4. RCD media readable on millions of CD-ROM drives.
5. More reliable than tape.
6. Faster than tape.
7. 1 MB buffer to ensure hard drive compatibility.

3 DRIVES IN 1

1. 2X CD Recorder
2. Double-speed CD-ROM Player
3. Tape Drive Replacement

☎ 800-553-7070

PINNACLE MICRO
THE OPTICAL STORAGE COMPANY

Tel. 714-789-3000 Fax 714-789-3150

Circle 115 on reader service card

If you're tie-dye and they're black-tie—

Let the DOS on Mac card from Reply tie your Mac in with their PCs

Now as a Mac user in a corporation with mixed DOS and Mac environments, you don't have to feel like you're left out in the cold.

Reply's **DOS** on **Mac** card is designed with a real 486 or Pentium OverDrive processor to deliver performance equal to a dedicated PC. Plugging directly into the PDS slot of your Mac the **DOS** on **Mac** card provides direct access to all your Mac peripherals. Open, run and print DOS/Windows applications, use DOS/Windows CD-ROMs, even copy and paste between Macintosh and Windows applications.

The **DOS** on **Mac** card is the fast, affordable way to run DOS and Windows on Macintosh Quadra and Centris and Power Macintosh 7100 systems.

Call us today and swim with the rest of the gang.

1-800-801-6898

Reply Corporation
The System Enhancement Company
Telephone: 408-942-4804 Fax: 408-956-2793

Reply Corporation, DOS on Mac and the Reply logo are trademarks of Reply Corporation. All other products referenced are trademarks of their respective companies.

a Newton as my primary E-mail and fax point of service, not because I have to, but because it is lightweight, small, and unobtrusive. I've had the pleasure of evaluating for the same purposes a Magic Link from Sony (on which this was written, with my PowerBook sitting asleep next to me) and find it equally fitting.

I wouldn't trade my PDA for the world. It has intimately changed how I work, not because I am a PDA software developer, but because it gives me what I used my laptop for in a small package I can use anywhere, anytime, with the same effort I use using a sheet of paper.

Ray Rischpater
AllPen Software
Los Gatos, California

Working Even Smarter

JIM HEID'S APRIL 1995 *WORKING SMART* column on speeding up Macintosh performance was very informative, but there are a couple of things that should be mentioned about multimedia performance: (1) When you're running QuickTime 2.0, make sure you also install Multimedia Tuner (as indicated in the "Bugs & Turkeys" section of April's *News*), as this greatly improves movie playback performance; (2) QuickTime 2.0 can actually slow down some applications that were written for earlier versions of QuickTime. One example is Brøderbund Software's game Myst, which runs fine with QuickTime 1.6 but is nearly unusable with QuickTime 2.0.

Eric Bicker
Barrington, New Jersey

Type Problems

I WOULD LIKE TO SOLICIT YOUR HELP with a situation that I believe can be adversely affecting my and my product's reputation.

There is a Star Trek convention touring the United States, and maybe worldwide, at which a regular vendor is selling a font package named Jackill's Future Fonts v1.0. I am told by people—at least the 30 that took the time—who have purchased this product that it is defective, if not a total rip-off! The packaging claims 50 fonts, but some users are reporting that they cannot access any fonts; those that can, encounter yet another problem—defective fonts. Both Mac and IBM users are affected.

My problem is that my name is the *only* name that appears anywhere in or on the packaging, due to the fact that they used my product, theTypeBook, in their package in some way. Consequently, I am receiving all of what should be complaints directed to them. If I knew who they were I would attempt to contact them myself; however, I do not, and neither do any of their customers.

I have already made public posts on CIS and AOL, but the message has only a limited reach.

Jim Lewis
via America Online

But Will the NEA Approve?

I ENJOYED READING THE *MACWORLD Online* column's pick of art sites on the Internet in the April 1995 issue. Another site your readers might enjoy is the Medical Illustrators' home page, **http://siesta.packet.net/med_illustrator/Welcome.htm.**

Cecil Greek
via the Internet

Wahoo—illustrations of pancreatic cancers! Just be careful if you decide to visit this site before lunch. —Macworld Online

Taken to Task over Works

YOUR REPLY TO A LETTER THAT APpeared in the April 1995 issue from a disgruntled Microsoft Works 4.0 user complaining about "permanent page mode" was unfair to him and to ClarisWorks and its users. Your claim that ClarisWorks "displays documents in page view only" is not true. ClarisWorks has a Page View menu item to allow control over this feature. And when in Page View, it is still possible to fine-tune the display to suppress page breaks or margin display. WYSIWYG should not be used as an excuse for inflexibility or foisting elegant inconvenience on consumers. ClarisWorks gives flexibility, allowing its users to choose a display mode that suits them at any particular stage of their work. Microsoft should be chastised for this human interface error.

David Crowe
via CompuServe

Letters should be sent to *Letters, Macworld,* 501 Second St., San Francisco, CA 94107; via fax, 415/442-0766; or electronically to CompuServe (70370,702), MCI Mail (294-8078), America Online (Macworld), eWorld (Macworld), AppleLink (Macworld1), or via the Internet (**letters@macworld.com**). Include return address and daytime phone number. Due to the high volume of mail received, we can't respond personally to each letter. We reserve the right to edit all letters. All published letters become the property of *Macworld.* ■

FreeHand 4.0, 1994 MacUser Eddy Award

"BEST NEW DRAWING TOOL"

Feel The Power For Only $149.

Feel the flexibility with dozens of new plug-in tools and palettes. Even use existing Illustrator plug-ins right within FreeHand!

Feel the power of page layout with text style sheets, spelling checker, columns, search & replace, copyfitting, linked text blocks, even multi-page support!

Feel the precision of "snap-to" grids, guides, and points–plus magnification of up to 25,600% on a massive 22' x 22' pasteboard!

New FreeHand 5

Feel the possibilities of special effects like Fisheye Lens, 3-D Rotation, Multi-color gradients, Calligraphy Pen, even Drag & Drop color!

Feel the speed of working in the fastest WYSIWYG preview mode–faster than Illustrator and all the others!

MacOS

The editors of MacUser felt it. And now you can feel it too. The ultimate power and unlimited freedom in design and illustration, in new Power Macintosh native FreeHand 5. All for only $149. We'll prove it.

On our free Showcase CD, you'll see what the power of FreeHand can do for artists, designers, illustrators, desktop publishers and multimedia mavens just like you.

So call for the FREE CD. Or upgrade for only $149. And feel the power of FreeHand 5 for yourself.

FREE SHOWCASE CD-ROM*
1-800-326-2128

ASK FOR OPERATOR #714

FREEHAND
DIRECTOR
AUTHORWARE
MACROMODEL
SOUNDEDIT 16
FONTOGRAPHER

*Hurry, quantities limited. One CD per caller. **Proof of ownership required. Call 1-800-989-3762. Upgrade offer expires on Sept. 30, 1995. Offers valid in the U.S. and Canada only. Outside the U.S. or Canada, call 1-415-252-2000 or FAX us at 1-415-626-0554 in Europe call +(44) 344 76 1111. Macromedia and the Macromedia logo are registered trademarks of Macromedia, Inc. FreeHand is a trademark of Macromedia, Inc. Other names are trademarks of their respective holders. © 1995 Macromedia, Inc.

Only $149

Quark XPress Offer!

**Move to the power of FreeHand 5.0 for the Mac for $149. Available to current FreeHand users and users of Quark XPress, Canvas, MacDraw, Adobe Illustrator and PageMaker. Offer expires September 30, 1995.

MACROMEDIA®

Circle 244 on reader service card

TIRED.

SyQuest 200MB
TECHNOLOGY
5.25" Removable Cartridge
RECORD
DC-2120 QIC 80 FORMATTED
1/4" MINI DATA CARTRIDGE
550 Oe 15,000 FTPI 307.5 FT / 93 M
maxell
HD BACK-UP 12
DO NOT COVER
BERNOULLI
MultiDisk
150

WIRED.

Warrantied for life, DynaMO 230MB disks provide an absolutely reliable, inexpensive and high performance way to store and transfer files.

Tired of space limitations? Lost data? Expensive cartridges? The old storage technology is just that. Old.

Get wired! With the Fujitsu DynaMO™ optical drive, the new standard in high-capacity data storage, you can reliably store and transport all kinds of large files. Even the most demanding graphics and multimedia applications.

DynaMO's industry-standard, 3.5" 230MB cartridges provide greater storage capacity for about 17¢ per megabyte. So you can save larger files while you save money.

DynaMO also protects your data better. Since it uses magneto-optical media, DynaMO is immune to the problems that plague removable magnetic media. It's simply the most stable medium you can buy for transporting files or storing them.

That's why DynaMO disks come with an exclusive lifetime warranty from Fujitsu, the world's second largest computer company.

And no matter what your application, from color separations to multimedia to backing up, DynaMO is faster than ever before. Up to 60% faster in the Mac version equipped with Turbo MO software.

No wonder DynaMO outsells all other optical drives. Highest performance, lowest cost, unmatched reliability. Get DynaMO and you've got it wired.

1-800-898-1302

FUJITSU

COMPUTERS, COMMUNICATIONS, MICROELECTRONICS

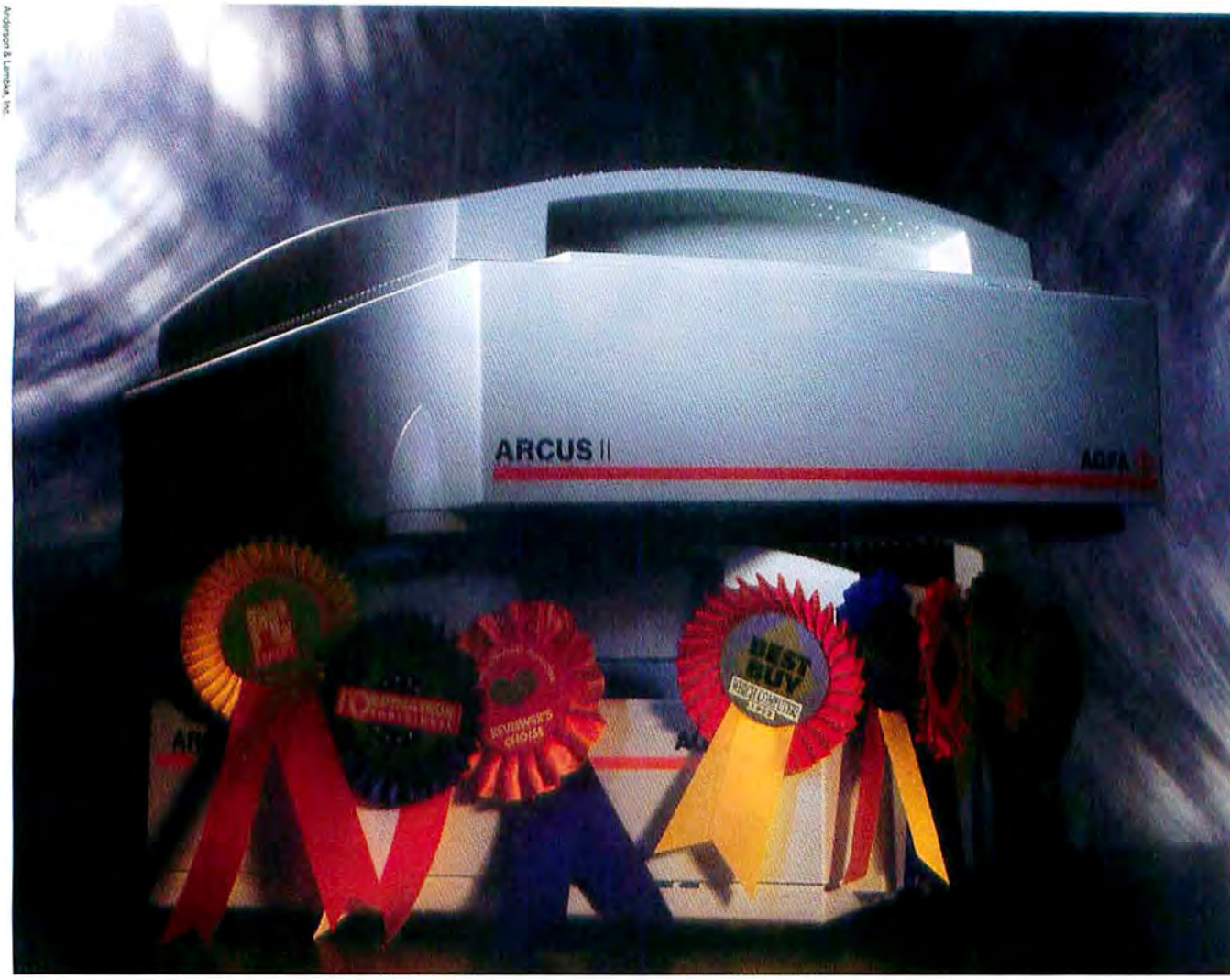
DynaMO Specifications

Capacity	128-230MB
Data Transfer Rate	2.1 MB/sec.
Average Seek Time	30 ms
Rotational Speed	3,600 rpm
Disk Warranty	Lifetime
Weight	2 lbs.

© 1994 Fujitsu. All rights reserved. All brand names and product names are trademarks of their respective holders.

Circle 202 on reader service card

Anderson & Lembke, Inc.



FIRST WE CHALLENGED THE COMPETITION. THEN WE CHALLENGED OURSELVES.

Presenting the new Agfa Arcus II.

With all the praise the Arcus family has won, you'd think we'd rest on our laurels. Think again. The Agfa Arcus II is a completely new, 600 x 1200 ppi, 36-bit color scanner with an integrated transparency module. It's also designed to be the best machine you can put on your desktop.

Compared to other "desktop" scanners, the new Arcus II can capture more highlights and shadows, thanks to its 3.0 dynamic range. That's the kind of image quality you used to have to send out for. Plus, no other top-of-the-line "desktop" scanner comes with Agfa FotoLook scanning software, Agfa FotoTune color management software, and full Adobe Photoshop™ software built in.

And no one else can offer you our new, 42-page *Introduction to Digital Scanning*, which takes you step by step through a variety of scanning situations.

Truth is, with everything we added to the Arcus II, we're expecting some more awards. But the real prize winner will still be you. Call 1-800-685-4271 to find out more information on Agfa's new scanners.

AGFA Agfa
The complete picture.

AGFA and the Agfa rhombus are registered trademarks. Photoshop is a trademark of Adobe Systems Incorporated, which may be registered in some jurisdictions.

Circle 43 on reader service card

LATE-BREAKING NEWS

MacBulletin

Apple Unveils Power Mac 6200 Series Apple Europe recently began shipping the Power Macintosh 6200/75 and the Performa 6200CD, both of which have a 630-series–type system box and run on a 75MHz PowerPC 603 processor. If Apple follows its typical pattern, it is likely to introduce a U.S. version of the 6200 later this year.

The 6200-series machines both include 8MB of RAM, expandable to a maximum capacity of 64MB. The RAM is in the form of an 8MB SIMM that occupies one of the system's two 72-pin SIMM slots. The processor has a 16K on-chip cache and connects to a 256K Level 2 cache, which it needs to achieve performance roughly equivalent to that of a 60MHz PowerPC 601 chip without external cache. The European configurations include a 500MB IDE hard drive and a CD-ROM drive.

Essentially a Power Macintosh 5200 motherboard in a modular 630 box, a 6200 can accommodate the same multimedia expansion options as a 5200 (Apple's latest LC machine) or 630, including the internal TV tuner. The 6200 also has an LC III–compatible PDS slot, a communications slot, and a video-input slot. Also like the 5200 and 630, the 6200 has an infrared remote sensor, sound controls, and a headphone jack, all on the front of the case. The built-in video supports monitors as large as 15 inches. The systems have two serial ports, one ADB port, a SCSI port, a mono sound-in port, and a stereo sound-out port. The Performa comes bundled with more applications. The Performa 6200CD will sell in Germany for about DM 3000 ($2182.50), but Apple's prices are generally higher in other countries than in the United States.

An Apple representative recently confirmed that the systems were introduced in Europe on April 28, but when asked by *Macworld* about the planned date of introduction in the United States, the representative said, "Apple does not comment on unannounced products. We haven't announced that system here in the U.S. . . . That product doesn't exist in the U.S. at this stage." The Apple representative also noted that Mac configurations can vary from country to country.

Apple Discontinues Power Mac Upgrades Apple recently discontinued its existing Power Mac motherboard upgrades. To help meet demand for Power Mac upgrades, the company licensed its Power Macintosh Upgrade Card (an add-in card) to DayStar Digital. Apple will no longer sell that product in the United States, but will continue to support existing Power Mac Upgrade Cards. DayStar, 404/967-2077.

Faster CD-ROM for Summer Macs Apple has replaced its double-speed CD-ROM drive with a quad-speed model. The $349 AppleCD 600e also comes in an internal version, one that Apple will ship this summer in Macs and Power Macs sold with internal CD-ROM drives. Apple Computer, 800/538-9696.

SyQuest Introduces Zip Competitor On the heels of Iomega's well-received Zip drive, SyQuest recently announced the EZ135 Drive, which stores 135MB on removable cartridges and should have a street price around $200. SyQuest says the 13.5ms average access time and maximum 2.4MB-per-second sustained-data rate of its 135MB 3½-inch removable Winchester drive yields twice the performance of Iomega's Bernoulli-based Zip. Internal and external SCSI versions should ship in July. SyQuest, 510/226-4000.

Justice against Microsoft The U.S. Department of Justice filed suit to prevent the proposed $2-billion merger of Microsoft with Intuit, the dominant maker of personal-finance software. The suit alleges that the merger will be anticompetitive. m

News

EDITED BY TOM MORAN

IN THIS ISSUE

p. 35 Power Computing Clones **p. 36** From SIMMs to DIMMs **p. 36** Do-It-Yourself Web Pages
p. 37 More Apple Updates **p. 41** Symantec's Crucial Compiler
p. 118 Color-Calibration Tools **p. 122** Low-Cost Internet Connections **p. 138** Macs as Internet Servers

System 7.5 Update Causes Conflicts

GORDON STUDER

Apple's recently released System Update 1.0, which upgrades System 7.5 to 7.5.1, is causing conflicts with a long list of software and hardware (see *MacBulletin*, June 1995). Designed to fix bugs and improve system performance, the update also offers improved file sharing, lets users drag and drop items to the Launcher, handles low-memory situations better, and lets the keyboard power-on key double as a power-off key.

Software Problems The most common problems by far are crashes on shutdown. Two extensions have been identified as causing such crashes, both from Symantec. MacTools Pro's TrashBack (503/690-8090) is one of the culprits; versions 4.0 and 4.0.1 now have a free updater (to version 4.0.2), which resolves the conflict. The updater is posted on Symantec's BBS and all online services.

The other problem extension is Norton Partition 2.0. Formerly part of Norton Utilities (503/334-6054), Partition was discontinued as of NUM 3.0 and will not be patched. Symantec recommends that you back up partitions and delete them, then switch to another product, such as a hard disk–formatting utility or file-security utility.

If you suffer from crashes and have neither TrashBack nor Norton Partition installed, your problem is probably an old and incompatible SCSI driver on one or more of your hard drives. Updating with a current, System 7.5–compatible driver utility (such as FWB's Hard Disk ToolKit, Casa Blanca's Drive7, or CharisMac's Anubis) should solve the problem. You should update the SCSI driver before running the system updater, and preferably before installing System 7.5.

If Aladdin Systems' StuffIt SpaceSaver 3.5 loads after the new General Controls, files will become invisible. No data is lost, but the files are inaccessible from the Finder. At press time, Aladdin (408/761-6200) had yet to determine the cause of the problem. Meanwhile, the workaround is either to use an extension manager, such as Conflict Catcher 3 from Casady & Greene (408/484-9228) or Now Startup Manager (part of Now Utilities 5) from Now Software (503/274-2800), or to get SpaceSaver to load before General Controls by

renaming one of the two files.

Also, if you unmount a shared removable volume in System 7.5.1 with SpaceSaver loaded, it will lock up the Mac. This is due to a design change Apple implemented in File Sharing, and thus may affect other products besides SpaceSaver. It is still unclear who will provide the fix, or when.

SpeedyFinder7 1.5.9i, the latest version of the versatile shareware control panel, will not load under System 7.5.1 because it does not recognize the new Finder. Unregistered copies expired on March 15, and users have been urged to upgrade to the commercial package encompassing SpeedyFinder7's features: Aladdin Desktop Tools 1.0.

Under 7.5.1 with File Sharing enabled and Connectix's RAM Doubler 1.5.1 installed, files on CD-ROMs may "disappear." Data is not affected, but access to it is. Connectix (415/571-5100) says the problem also occurs with System 7.5, and that RAM Doubler version 1.5.2 will fix it and other bugs. That version should be shipping by the time you read this.

Metrowerks' CodeWarrior PowerPC debugger, MW Debug/PPC, did not work with 7.5.1: Metrowerks (514/747-5999) has released an updater to the Net and to online services.

The E-Machines 3.5.5 control panel for E-Machines' graphics cards and Futura II/DSP cards will cause a crash when a Macintosh boots with the update installed. As E-Machines was absorbed by SuperMac before SuperMac was in turn merged with Radius, an update is unlikely. Radius (408/541-6100) does offer an upgrade path for E-Machines owners, however.

Apple's Find File 1.1.1 (408/996-1010) now works with Apple's foreign-language script systems (under WorldScript II). However, users of those systems with 2-byte characters, such as the Japanese, Chinese, and Korean Language Kits, had drastic

continues on page 37

Power Computing Clones Arrive

USERS GET CHOICE OF SYSTEM CONFIGURATION

Power Computing, the first company to get an Apple license to produce Power Mac clones, shipped its first Macs in limited quantities on May 1, with volume shipments expected on June 1. The company hopes to compete with Apple's Power Macs by offering equivalent systems with a wider range of configurations, lower prices, and better technical support. The first Power Computing Macs will be PowerPC 601–based desktop systems comparable to Apple's Power Mac 7100 and available in three speeds: 80MHz, 100MHz, and 110MHz. A tower system comparable to Apple's Power Mac 8100 should begin shipping in June, as should the 80MHz desktop model.

KEVIN CANDLAND

The Power 100 includes a 100MHz PowerPC 601 processor.

All three of Power Computing's Power systems—the Power 80, Power 100, and Power 110—will come with the same ports as Apple's Power Macs, including SCSI, ADB, serial, and Ethernet. Also included are three NuBus slots, a front-mounted speaker (which the company claims offers better sound fidelity than Apple's), a 256K cache card, an extended keyboard (an extra purchase for an Apple Mac) and mouse, as well as System 7.5.1, 300 PostScript Type 1 and TrueType fonts, and a special edition of IDG Books Worldwide's *System 7.5 for Dummies*. You also get software: the current versions of Intuit's Quicken; ClarisWorks; and Now Software's Now Utilities, Now Contact, and Now Up-to-Date.

The standard, accelerated video card will have 2MB of video RAM to support millions of colors on a 17-inch monitor; the VRAM can go to 4MB to support millions of colors on a 21-inch monitor. A first for the Mac market, the video card includes dual video connectors (one standard Mac DB-15 and one standard VGA), so you can use PC-style monitors without buying an extra adapter. To use a PC-style monitor in a Power Computing Mac without the card, you need an adapter.

Power Computing will sell direct, so customers can get the systems configured as they prefer. Customers will have a choice of hard drive capacity, ranging from 365MB to 9GB; installed RAM capacity, ranging from 8MB to 200MB; and monitor size, ranging from 14 inches to 17 inches. Other options include a quad-speed CD-ROM drive and an AV video card instead of the standard video card.

In the future, Power Computing expects to offer DOS cards, removable-media drives (such as SyQuest and perhaps Zip), and possibly systems that support both NuBus and PCI buses. Planned for summer or fall release are PCI-based Power Macs (in-

continues

In Brief

Updated File Translation

The newest version of the MacLinkPlus file-translation program includes a utility called FileView that lets you view files created by programs you don't have. MacLinkPlus also contains updated translation filters to handle the latest versions of Microsoft Word, Excel, and Works for Mac and Windows, and WordPerfect, WriteNow, and ClarisWorks for Mac. The Easy Open Translators version costs $109; it contains Macintosh Easy Open, FileView, and all translators. The $149 Translators Pro version adds Macintosh PC Exchange DOS-mounting software, while the $199 PC Connect adds PC Exchange and a cable to directly connect PCs and Macs. 203/268-0030.

Apple Tech Support Goes Online

Apple Computer has added an online tech-support area for its products to the company's eWorld online service. Users in the United States can post questions in the Ask Apple, USA forum (inside the Apple Customer Center in the eWorld Computer Center) and should receive answers from Apple's tech-support staff within one business day. There are no extra charges beyond the normal connection fees.

2 Million Strong

America Online recently welcomed its 2 millionth member, surpassing CompuServe and Prodigy to become the United States' largest online service. 800/827-6364.

Modem Merger Final

The stockholders of U.S. Robotics and Megahertz Holding gave final approval to the merger of the two companies. Now called U.S. Robotics Access and Megahertz Holding, both are now wholly-owned subsidiaries of U.S. Robotics. 708/982-5010.

cluding models that use the faster PowerPC 604 CPU) and a low-profile model similar to Apple's Power Mac 6100.

Power Computing expects its systems' prices to be 10 to 15 percent less than equivalently configured Apple Power Macs. The company expects a Power 80, for example, to start at $2000, while a Power 100 would start at $2900.

One key difference Power Computing plans to offer customers is service. *Macworld* has found that Apple's customer support is habitually poor when it comes to new products, since representatives are usually not trained quickly enough to answer questions and solve problems. Power Computing hopes to be more active; it plans to call customers the day their systems arrive to ensure that everything was shipped and to follow up within two days to ensure that everything is working. Power Computing will offer toll-free technical support, and its goal is to connect callers to a representative within 3 minutes. The company will also offer a 30-day money-back guarantee.

Macworld's tests of prototype Power Computing Macs found them highly compatible and as fast as Apple's Power Macs (see "First Clones," *Macworld*, April 1995). Power Computing, 512/258-1350.

—GALEN GRUMAN

From SIMMs to DIMMs

NEW TYPE OF RAM ON THE HORIZON

In its next generation of Power Macs, due this summer, Apple is planning to use a new type of memory card called a DIMM (Dual In-line Memory Module), which promises much higher RAM capacity, considerably faster performance, and potentially greater security for personal computers. The DIMMs have 168 pins in two (dual) rows of contacts (one row on each side of the card). The older SIMM (Single In-line Memory Module) cards have 72 or 30 contacts that are the same on both sides.

With the additional pins, a computer can retrieve information from DIMMs 64 bits at a time instead of the 32- or 16-bit transfers usual with SIMMs. Although you will be able to add DIMMs to the coming Power Macs one by one, if you install DIMMs in pairs they can support interleaved memory, so the computer can retrieve 128 bits at a time for even faster operation. (Some early Quadras had this capability with their SIMMs, resulting in a speed boost of about 5 percent.)

DIMMs will be available in 4MB, 8MB, 16MB, 32MB, 64MB, and 128MB sizes, so a future computer with eight DIMM sockets could conceivably handle 1GB (1024MB) of RAM. That huge amount of memory could change the way users work—for instance, possibly letting them create very large RAM disks for a high-performance computer.

DIMM memory speeds will probably stay at 60 nanoseconds (ns) for some time, at least for mass-production computers. Faster memory—40ns and 50ns—is expensive and hard to find, and a memory cache adds nearly the same speed advantage.

ROBERT PERRY

The next generation of Power Macs will use DIMM strips similar to those shown above.

The Joint Electron Device Engineering Council (JEDEC) set the DIMM specification as an industry standard, so you will see the new memory card on many different kinds of computers. The spec allows for some extensions beyond simple memory, such as error checking and correction to improve reliability for critical computer applications and extended memory addressing to support encryption for secure communications.

DIMMs will initially cost slightly more than SIMMs on a per-megabyte basis, but the cost premium should vanish after a few months as DIMMs become common. Memory prices have been largely stable for the past five years, despite some hiccups, as demand continues to outstrip supply by a small margin. Some observers expect a sharp increase in demand late this year as Windows 95 ships, since several PC makers will be adopting DIMMs as well, and Windows 95 systems will likely require 16MB or more.

Old SIMMs will not fit into DIMM sockets, although some companies may build socket adapters (so that people moving to personal computers with DIMM slots can use SIMMs from their old machines, reducing the overall initial cost of upgrading to the new system). Adapters would have to cope with three problems. The memory-addressing circuitry in the adapter will slow down memory access slightly, the additional layer of contacts could reduce reliability, and mechanical fit will be a challenge in the tight space inside some computers. A few companies will remove RAM chips from old SIMMs and install them on a DIMM, but remanufactured cards will always have lower reliability than new cards.—CARY LU

THE AMCOEX INDEX OF USED MACINTOSH PRICES

Machine/RAM/Hard Drive	Average Sale Price	Monthly Change
PowerBook 100/4MB/20MB	$375	–$25
PowerBook 140/4MB/40MB	$625	–$50
PowerBook 180/4MB/80MB	$1400	–$125
PowerBook Duo 230/4MB/80MB	$725	–$100
Mac Classic/2MB/40MB	$275	–$50
Mac SE/30/2MB/40MB	$475	–$50
Mac LC II/4MB/40MB	$400	$0
Mac IIsi/3MB/40MB	$400	$0
Mac IIci/4MB/80MB	$650	+$25
Mac IIfx/4MB/80MB	$700	$0
Centris 650/8MB/230MB	$1275	+$50
Quadra 900/8MB/160MB	$1850	–$50

Index provided by the American Computer Exchange of Atlanta (800/786-0717). It reflects sales during week of April 20. Configurations include keyboard and exclude monitor and display board for noncompact models.

Web Design Spins Up

COMING SOON TO A PROGRAM NEAR YOU

Designing your own World Wide Web page is getting easier. A host of products—add-ons to major applications, stand-alone programs, and shareware products—let you design documents in the Web's HTML (HyperText Markup Language) format.

HTML is a set of formats used to define document styles, layout, and hypertext links. Rather than requiring users to type HTML style tags, which is common in older HTML editors, the new

applications let users pick an HTML style—a particular kind of header, or a format for emphasis—and apply it to selected text.

Frame Technology has licensed a version of Quadralay's WebWorks, a translator that will be included in FrameMaker 5.0. Microsoft plans a Mac version of its Internet Assistant, a free add-on for Word that lets users create and browse Web pages. Quark is working on Orion, an XTension to QuarkXPress that can save documents in HTML format (see "Quark Extends Beyond Page Layout," *Graphics* news, May 1995).

Quarterdeck plans a Macintosh version of its WebAuthor plug-in for word processors; the company has not announced a release date. This summer, WordPerfect, Novell Applications Group, will release Internet Publisher, an add-on to WordPerfect with HTML capabilities similar to Microsoft's Internet Assistant for Word; WordPerfect's Internet Publisher Pro CD-ROM will also include TCP/IP connectivity.

Leading the stand-alone HTML editor pack is SoftQuad's HoTMetaL Pro, a $195 editor now shipping. The product has strict HTML rules checking and includes templates, tables, style sheets, and an import feature.

Links to a variety of free and shareware HTML editors can be found at **http://www.yahoo.com/Computers/World_Wide_Web/HTML_Editors/Macintosh/** on the Web. For more on the World Wide Web, see *At Work* news and *Networks* news in this issue.

Frame Technology, 408/975-6000; Microsoft, 206/883-8080; Quark, 303/894-8888; Quarterdeck, 310/392-9851; SoftQuad, 416/239-4801; Vermeer Technologies, 617/576-1700; WordPerfect, Novell Applications Group, 801/225-5000.

—JOANNA PEARLSTEIN

"SYSTEM 7.5" *continued*

slowdowns during some find operations. Users with such script systems installed will be affected even if using a Roman

script at the time. Many are going back to Find File 1.0.

Apple confirms that there's a problem with Macs freezing on start-up when the new General Controls control panel loads. Some users have solved the problem by deleting the General Controls Prefs file; some, by reinstalling the update; others have gone back to General Controls 7.5.

Scott Berfield's shareware benchmark utility Speedometer 4.0.1 erroneously reports a slowdown in math performance on Power Macs with the update installed, according to many users.

Hardware Problems Sophisticated Circuits says its PowerKey devices (for turning on and shutting down the Mac) within the serial number range of approximately 33000 through 38000 may have a conflict with System 7.5 Update 1.0 on certain Macs. With these units, pressing the control, option, shift, or ⌘ key will bring up Apple's new Shut Down dialog. Sophisticated Circuits (206/485-7979) will replace the affected units free of charge. The company also offers a free control panel called Shut Down Control that fixes the problem. It is available from Sophisticated

continues

Even More Updates

APPLE OFFERS SEVERAL FIXES NOT IN SYSTEM 7.5.1

Several of Apple's recent updates have not been rolled into System 7.5 Update 1.0. Among these are Apple MultiMedia Tuner 2.0.1, PC Setup 1.0.3, Network Software Installer 1.5, and LaserWriter 8.2.2. PC Setup 1.0.3 ships with Apple's 6100/66 DOS Compatible system and Reply's DOS on Mac cards, but the System 7.5 Update installs PC Setup 1.0.2. You can safely run Network Software Installer 1.5 before or after installing the System 7.5 Update; the two do not affect any of the same files. The System 7.5 Update 1.0 installs LaserWriter 8.2; LaserWriter 8.2.2 (available from **ftp.support.apple.com**) fixes a bug that prevents using printers in remote zones on multizone Ethernet networks.

Despite indications in the Read Me file to the contrary, 680X0 Macs use the ThreadsLib file that Easy Install places in most System Folders; this file fixes a bug in preemptive threads.

The 040 VM extension is rolled into the System 7.5 Update, while the Secret About Box from System 7.5 has been removed with the update. Also, for anyone whose Mac didn't lose its identity in the About This Macintosh window during the upgrade to System 7.5, the new update will get you. You can use Jonathan Jacobs' shareware application WhoAmI? 1.0 or Flux Software's freeware extension Mac Identifier 1.1.1 to reassert your Mac's individuality.—PETER M STOLLER

In Brief

More Mac for Unix Systems

Apple has announced Macintosh Application Environment (MAE) version 2.0, which lets Sun and Hewlett-Packard workstations run Mac apps in an X Window with better networking support. Like the previous version, MAE 2.0 runs off-the-shelf Mac programs, but now it also supports AppleTalk so that technical Unix workstation users can share common resources. Apple also says that version 2.0 is more than 50 percent faster, has an improved NFS file system, and has players for QuickTime and HyperCard. 408/996-1010.

Upgrading PowerBook 520's and 540's

Sonnet Technologies is shipping the PowerBook FPU Upgrade, a 68040 processor board that's the first method for adding a floating-point unit (FPU) to the PowerBook 520 and 540 series. The Sonnet upgrade includes a Motorola 33/66MHz 68040 processor with an on-chip FPU. It also increases the overall compatibility of the PowerBook 520 and 540 because some applications require an FPU. The board boosts the performance of a PowerBook 520 by 30 percent, making it the same speed as the PowerBook 540. The $449 list price for the the PowerBook FPU Upgrade includes installation and requires the trade-in of the original processor board. 714/261-2800.

28.8-Kbps PC Card Fax Modem

Simple Technology announced the 28.8 Communicator, the first 28.8-Kbps PC Card (PCMCIA) fax modem that also includes voice capability and can connect through a cellular phone. The voice capability lets the 28.8 Communicator record phone calls like an answering machine. Expected to ship in May, the $469 device fits in a Type II PCMCIA slot. 714/476-1180.

GORDON STUDER

Circuits' online forums. On AOL or eWorld, use the keyword **sophcir**. On CompuServe, use **go sophcir**. On the Internet, it is available for anonymous FTP at **ftp.halcyon.com** in the directory **/local/sophcir**.

Power Macs using a CPU booster that happens to match the speed of another Power Mac model will prevent the update enabler from loading. If the boost is to some other speed, the enabler will load. Even with the update installed on disk, you will not see the new start-up graphic, and About This Macintosh will report your System version as 7.5. KS Labs (614/374-5665), Newer Technology (316/685-4904), and Output Enablers (no phone, reachable at **oe@io.com** or **http://www.io.com/user/oe/index.html**) have released free patches to online services and the Internet. Output Enablers claims its patch should work for CPU boosters from other makers.

The software for DayStar Digital's Turbo 601 PowerPC accelerator is not compatible with System 7.5.1. DayStar recommends that owners of the Turbo 601 not update to 7.5.1 until they have updated their Turbo 601 Control software to version 1.1, which DayStar posted online in April. Users who have already installed Apple's update should remove the System Update 1.0 file from the System Folder before installing the Turbo 601. With both the update and DayStar control panel installed, the Mac will bomb with an Unimplemented Trap error at start-up.

Installation Problems

Using the Easy Install option with extensions on can lead to all sorts of difficulties, from excessive disk swapping to corrupted installs. Always install software with extensions off. If you are installing from a CD-ROM, use Extensions Manager to disable all extensions except those needed in the CD-ROM drive.

If the Launcher is set to show at start-up before you install, you will be still using the old version of the Launcher after you install the update. Why? The Installer moves the old Launcher to an Installer Temp folder inside your System Folder, to be deleted when the Mac reboots. However, the Startup Items folder will still have an alias pointing to the old version. This will cause the old Launcher to open at boot time early enough to prevent the Installer Temp folder from being deleted. To solve this, close Launcher, open the General Controls control panel and uncheck Show Launcher at System Startup. Then trash the Installer Temp folder and go back to General Controls and reenable Show Launcher at System Startup. Be sure to replace any other aliases of the old Launcher.

When the System 7.5 Update 1.0 Installer replaces your old MacTCP with version 2.0.6, the new information is saved into both the control panel itself and a MacTCP Prep file in your Preferences folder. If you have a Prep file, you lose nothing. If you don't, however, you lose all your settings. Many systems administrators distribute preconfigured versions of MacTCP to their users. Thus, these users have no MacTCP Prep files. To avoid wiping MacTCP settings, check to see if you have a MacTCP Prep file. If you don't, open the MacTCP control panel, change the settings, close it, then reopen it and change them back. You will now have a MacTCP Prep file that will survive the update. System administrators can also distribute a MacTCP Prep file with their preferred setting prior to installing the Update.

If your copy of MacTCP is not named MacTCP—if it is named MacTCP 2.0.4, for example—the Installer will leave it untouched. To update MacTCP, you must then specify it in a Custom Install. If you have any Apple extensions or control panels that are either renamed or disabled by an extension manager, the Installer will not update them. The solution is to make sure all extensions have their original names, then enable them with your extension manager and reboot (while holding down the shift key) before running the Installer.

Problems running a Net Install of the update from a Novell server could be a matter of timing. PCs round off file creation and modification times, so when you move Mac files onto a NetWare server, their time stamps are rounded. Unfortunately, Apple's Installer demands that files it is installing be precisely as specified in the Installer script. Thus, it will often fail when installing from a NetWare server. One possible solution is to set up a Mac server with System 7 file sharing exclusively for installing Apple System updates.—PETER M STOLLER

BUGS & TURKEYS

Caere's OmniPage Direct 2.0 and OmniPage Pro 5.0 conflict with Adobe Type Manager 3.8.1 on Power Macs. At press time, Caere could not say when the problem would be fixed. Caere, 408/395-8319.

The Family Doctor CD-ROM, third edition, currently included in many Performa bundles, has a bug that garbles printed documents found with the Search command. Users can call the publisher and request a free update. Creative Multimedia, 503/241-4351.

RAM Doubler 1.5.1 on a Power Mac 6100/66 DOS Compatible will freeze your Mac if you save or transfer a file to the floppy drive. Connectix says a fix should be available the beginning of May. Users can download the patch from America Online or call Connectix, 415/571-5100.

inLarge, the Berkeley Systems software-magnification program for computer users with poor vision, crashes on any Power Mac. The company is working on a fix, which it says should be ready in a couple of months. Berkeley Systems, 510/540-5535.

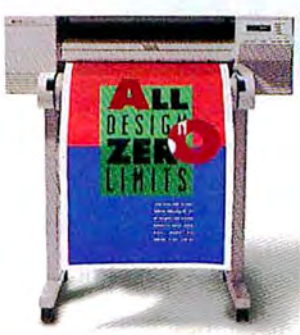
You couldn't print from the HP LaserJet 4M's multipurpose tray from Word 6.0, so you upgraded to a LaserWriter 8.X driver (or Word 6.0.1). Now with the 8.X drivers installed, you have problems printing envelopes. Lucky you, Hewlett-Packard's tech support will fax you an instruction sheet on how to configure the Envelope Tool in Word 6.0. Hewlett-Packard, 208/323-2551.

Macworld will send you a Bug Report T-shirt if you are the first to inform us of a serious, reproducible bug that we report in this column, or a Turkey Shoot T-Shirt if we shoot your turkey in this space. See *How to Contact Macworld.*

Introducing a printer for those who have ideas bigger than this page.

The HP DesignJet 650C/PS printer. Large-format at a small price.

$8,595*



Go on. Give yourself room to think. With the HP DesignJet 650C/PS, you can now print in sizes up to 2′ by 9′ (up to 3′ by 9′ with our larger model**). Right in your office. Right away. No tiling. No hang-ups. No problem. Just clean, inkjet output with PANTONE®†-licensed colors. Adobe™ PostScript™ Level 2 language and a built-in RIP are included. For an output sample, call:

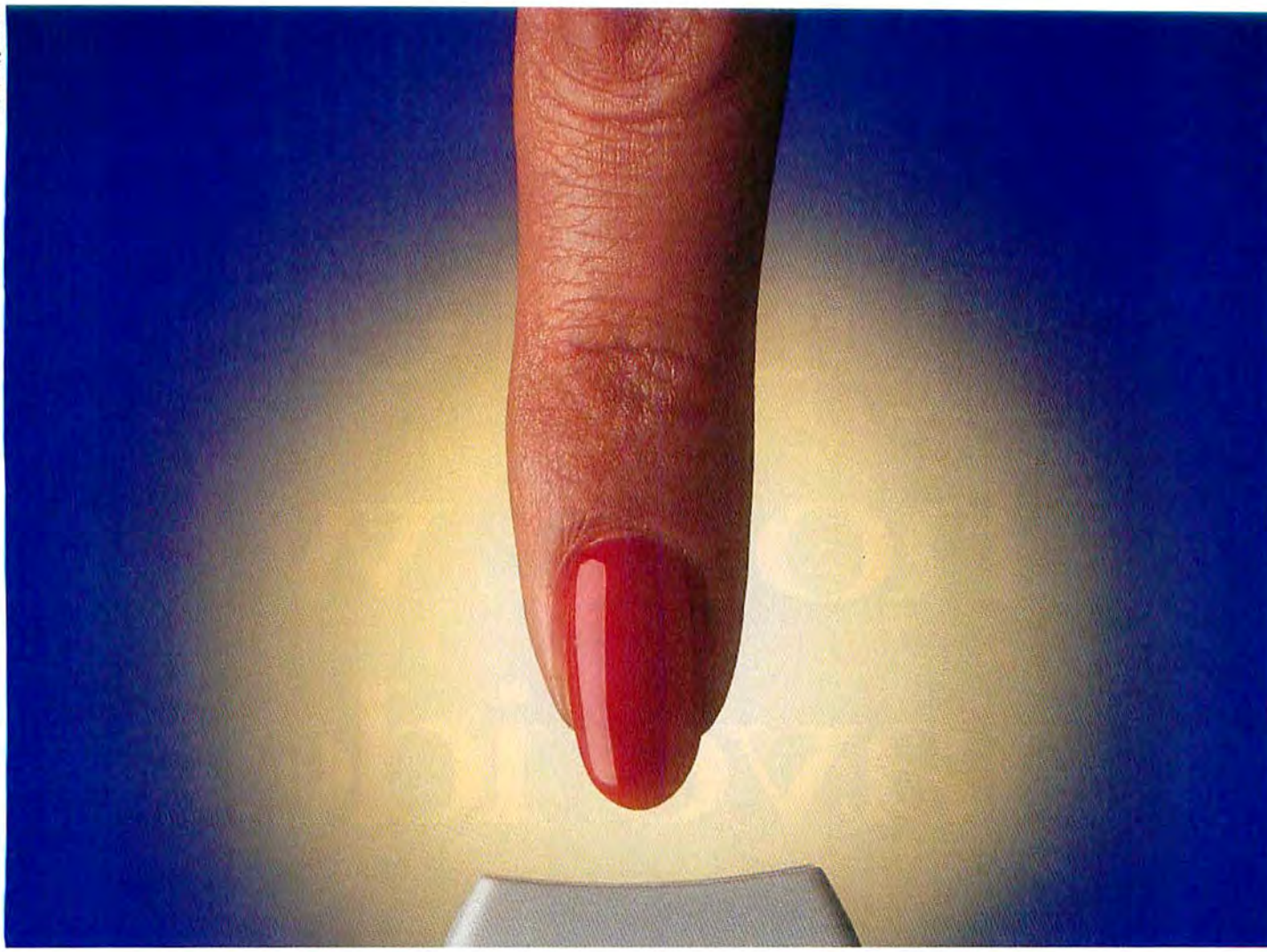
1-800-354-7622, Ext. 9064.

HEWLETT® PACKARD

Circle 11 on reader service card

*Suggested U.S. list price. **Larger model lists at $9,500. †Pantone, Inc.'s check-standard trademark for color. Adobe and PostScript are registered trademarks of Adobe Systems Inc. which may be registered in certain jurisdictions. ©1995 Hewlett-Packard Company PE12501

Anderson & Lembke, Inc.



WHAT OUR ENGINEERS HAD IN MIND WHEN WORKING ON OUR NEWEST SCANNER.

Introducing the Agfa StudioScan II.

Push a button, make a scan. Is it really that simple? With the new Agfa StudioScan II, it can be.

That's because StudioScan II was designed for simple operation. Two levels of scanning software are built in — easy-to-use Agfa FotoSnap and comprehensive Agfa FotoLook. Plus, our exclusive, 42-page *Introduction to Digital Scanning* will guide you through the scanning process.

What's more, every StudioScan II comes complete with Agfa FotoTune LE color management software and our IT-8 reference target, along with Adobe PhotoShop™ LE and OmniPage Direct™ OCR software. All in a 400 x 800 ppi, 30-bit, one-pass scanner. And all for about $1,000.

So if you want an easy way to bring a scanner into your office, all it takes is the new StudioScan II. And your finger. Call 1-800-685-4271, ext. 2743 to find out more information on Agfa's new scanners.

AGFA

The complete picture.

AGFA and the Agfa rhombus are registered trademarks. Photoshop is a trademark of Adobe Systems Incorporated, which may be registered in some jurisdictions. Omnipage Direct is a trademark of Caere Corporation.

Circle 158 on reader service card

Power Mac News

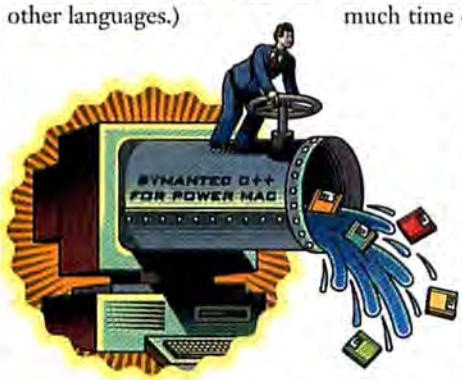
A Crucial Compiler Ships

SCORES OF NATIVE PROGRAMS TO FOLLOW

Over a year ago, when Apple began seriously ramping up Power Mac production, developers using Symantec's wildly popular C compilers were faced with a hard choice. They could switch their development efforts into the new, unfamiliar, but nonetheless ready-right-now Metrowerks CodeWarrior environment, or they could gamble that Symantec, Apple's semiofficial favorite in the compiler race, would have a native Power Mac version ready in a few months.

Late in March the long-awaited Symantec C++ 8.0 for Power Macintosh ($495, $149 upgrade from other Symantec products; 408/253-9600) finally shipped. The results of Symantec's work are impressive: Symantec C++ 8.0 is loaded with features (including a great class browser, Visual Architect for interface design, a greatly improved editor, an interface for Language Systems' LS Pascal), and it produces fast, compact code. (Look for a review elsewhere in this issue.)

For Power Macintosh users, the arrival of this compiler means that there will soon be native Power Mac versions of many specialized vertical-market programs. Developers working with Symantec include Radius, Adobe Systems, Taligent, Nisus, Novell, SAS Institute, Aladdin, Digital Media, and several hundred others. In some cases these firms have already produced Power Mac versions of a few key programs using CodeWarrior and are now reevaluating development strategy across their whole product lines. Michael Hecht, developer at statistics giant SAS, says, "We want to see if we can use Symantec as a single source for Power Mac and Windows compilers, instead of using an assortment of tools from a half-dozen companies." Many developers report recompiling their CodeWarrior-based products with the new Symantec compiler, looking for speed and code size advantages. (Metrowerks said it will ship this summer a version of CodeWarrior that, like C++ 8.0, will have a class browser and hooks to other languages.)



Perhaps even more significant long-term is that the new compiler should make it easy to port existing Windows software to the Power Mac architecture. Early users of applications ported to Power Macs using the Symantec system report significant performance advantages compared with applications ported to Power Macs using Microsoft's current conversion system for Visual C++ code. That may mean a solution to Apple's biggest problem: the sheer number of Windows apps versus the number of Mac apps.

Smaller companies that produce Macintosh vertical-market software, and developers working in-house at large institutions (such as Sandia National Labs, Purdue University, and the National Research Council of Canada), have been longtime Symantec Think compiler fans and are now announcing simultaneous development of Power Mac and Windows software using Symantec tools. Symantec believes that several hundred commercial programs will be recompiled to native Power Mac versions in Symantec C++ 8.0 before the end of the year.

As one developer of image processing software explained, "I sell into a niche market, and I couldn't justify spending much time on code modification. I waited for Symantec so I could generate a Power Mac version without any extra coding effort. Also, Symantec has a clear path from the Mac to the Windows world, again with minimal effort. I'm a year late to the Power Mac market, but I don't really have any competitors so it made sense to wait." For many other small developers of specialized software as well, the waiting is over.

Many industry observers agree that Metrowerks' development of CodeWarrior essentially saved Apple despite little or no encouragement from the company. The new Symantec system could have a similar but longer-term effect because of its potential for improving existing Power Mac applications, porting more 680X0 applications, and making Windows apps easier to move to the Power Mac.

—CHARLES SEITER

PETER HOEY

PowerWatch

THE LATEST ON PRODUCTS FOR THE POWER MAC

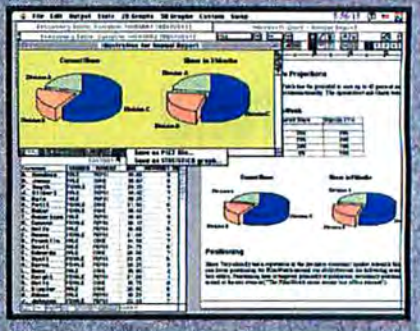
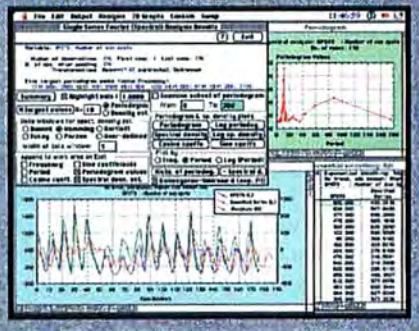
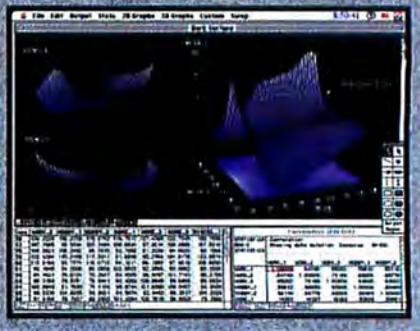
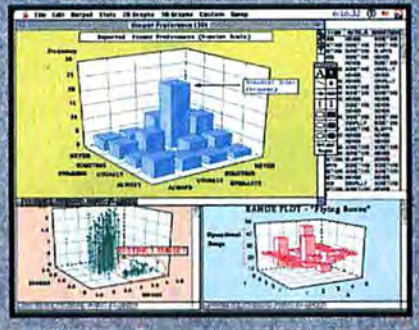
Avid Technology's entire Media Composer line of modular video-editing products are now Power Mac native. The company is offering Power Mac compatibility through either board upgrades or complete system upgrades. Call for pricing. 508/640-6789.

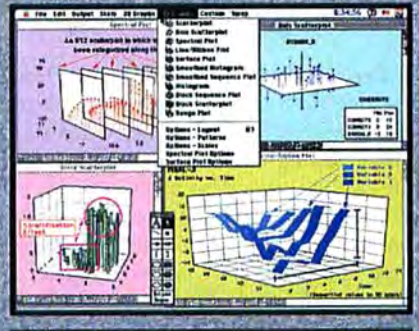
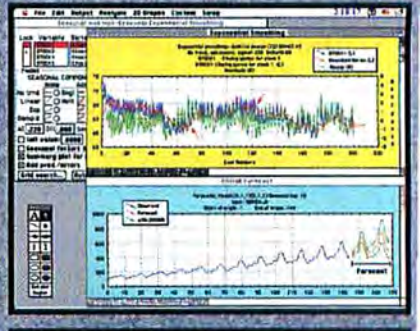
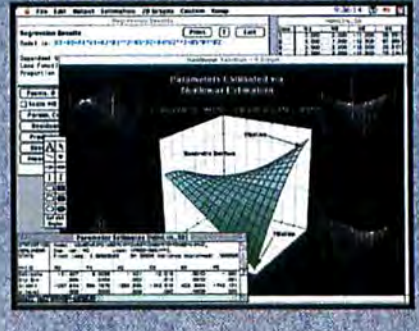
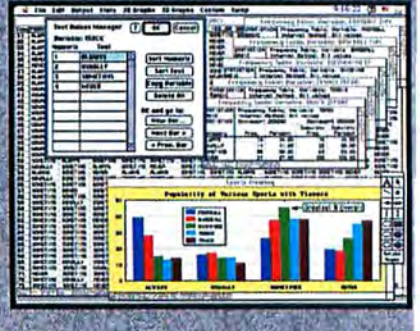
- Bentley Systems has released MicroStation V5, a $3950 CAD system. Owners of the 680X0 V5 version can upgrade for free; upgrade pricing for earlier versions varies. 610/458-5000.
- MathWorks has released MATLAB 4.2c mathematical software. It includes Notebook for Microsoft Word. Upgrade pricing for users of MATLAB 4.1 or 4.2 is $95; pricing for MATLAB 4.2c starts at $1695. 508/653-1415.
- Reply announced a DOS-compatible card for the Power Mac 7100/66 (but not the 7100/80). The $695 PDS card should ship in June 1995. 408/942-4804.
- Spyglass is shipping Spyglass Plot 1.0, a $295 data-analysis tool. 708/505-1010.
- Trinity Works is shipping the PowerPak clock-crystal accelerator, for all Power Macs except the 8100/110, for $129; a PowerPak with an optional 256K cache is $259. Trinity will offer trade-in credit on some of its single-speed clip-on accelerators.

As reported in *News* in this issue, Power Macs running System 7.5.1 won't start up if a clock-crystal accelerator is installed. Trinity says it has a free software fix. 800/278-4944.—SUZANNE COURTEAU

STATISTICA/Mac

Now rel. 4.

STATISTICA/Mac® A complete statistical data analysis system with hundreds of presentation-quality graphs integrated with all procedures ■ In-depth, comprehensive implementations of: *Exploratory techniques; Descriptive statistics; Frequency tables; Large selection of nonparametric tests; Stepwise multiple regression methods with extended diagnostics; General nonlinear estimation (with predefined or user-specified models); Logit/Probit analysis; General implementation of ANOVA/ANCOVA/MANOVA/MANCOVA (designs of practically unlimited complexity, repeated, nested, incomplete, random, changing covariates, contrast analyses, post-boc tests, custom designs); Stepwise discriminant function analysis; Canonical analysis; Large selection of time series modeling techniques with forecasting; Factor analysis; Cluster analysis (incl. hierarchical, k-means, and 2-way joining); Reliability/Item analysis; Log-linear analysis; General survival/failure time analysis (incl. life tables, group comparisons, and regression models); Distribution fitting (a large selection of continuous and discrete distributions); Curve and surface fitting and smoothing (incl. spline, DWLS, NEXP, and others);* and much more ■ Manual with comprehensive introductions to each method and step-by-step examples (Quick Reference booklet explains all major conventions); balloon help ■ Extensive data management facilities: a super-fast spreadsheet of unlimited capacity with formulas (and *Publish and Subscribe*); merge/split files; "double identity" of values (numeric/text); BASIC-like data transformation programming language; Import/Export data and graphs from Excel, STATISTICA/w and other formats ■ Graphs integrated with all procedures (e.g., click on a correlation coefficient to produce the corresponding scatterplot and other graphs; click on a variable in the descriptive statistics table to produce a histogram and other graphs; click on an interaction effect in the ANOVA table to see a plot of interaction) ■ Large selection of 2-dimensional graphs: *Histograms (incl. multiple, clustered breakdowns, overlaid functions), Scatterplots (incl. multiple, weighted frequency, smoothed, function fitting), Multiple line and Range plots, Trend plots, Standard deviation plots, Data sequence diagrams, Contour plots, Box-and-whisker plots, Column plots, Bar graphs, Double pie charts, Scrollable dendrograms, Two-way joining plots, Curve fitting plots, Distribution comparison plots, Range plots, Probability plots, Amalgamation plots, Factor space plots, Casewise outlier and residual diagrams, ANOVA interaction plots, Multivariate (multiple) matrix plots, exploratory Draftsman plots with histograms, categorized (multiple) graphs,* and many other specialized plots ■ Large selection of 3-dimensional graphs: *3D surface plots (with data smoothing procedures, color or gray-scale shading, and projected contours), 3D scatterplots, 3D block scatterplots, 3D axis (space) plots, 3D spectral plots with adjustable planes, 3D line/ribbon plots, 3D sequence block plots, 3D histograms, 3D surface-smoothed frequency plots, and 3D range plots ("flying boxes")* ■ All 3D plots displayed in true perspective, feature interactive real-time rotation facilities (incl. continuous rotation) ■ Extensive graph customization options: all structural aspects of graphs (axes, scaling, patterns, colors, sizes, styles, regions, perspective, rotation, fitted functions, etc.); MacDraw-style tools with specialized "objects;" hires. graph and artwork embedding; page layout/preview; dynamic rulers ■ All output displayed in Scrollsheets™ (dynamic, internally scrollable tables: all numbers can be instantly converted into a variety of on-screen customizable, presentation-quality graphs) ■ All contents of Scrollsheets can be saved as data and used for input, or be exported ■ Flexible facilities to perform analyses on specific subsets of data ■ Extremely large analysis designs ■ Unlimited size of files ■ Extended precision ■ Unmatched speed (e.g., on a Mac IIfx, arbitrary rotation of a surface with 1000 points takes 1 second; correlation matrix 50x50 with 100 cases—less than 3 seconds; transposing a 5000 data points file—less than 2 seconds) ■ Full support for System 7 ("savvy") incl. *Publish and Subscribe,* Apple events, balloon help, "drag and drop," 32-bit, etc. ■ Price: **$695.**

Quick STATISTICA/Mac® A subset of STATISTICA/Mac ■ All basic statistical modules of STATISTICA/Mac *(Basic and Descriptive Statistics, Frequency tables, Exploratory data analysis, Nonparametrics, Distribution Fitting, Stepwise multiple regression; ANOVA/ANCOVA)* ■ Manual with comprehensive introductions to each method and step-by-step examples (Quick Reference booklet explains all major conventions) ■ All data management facilities of STATISTICA/Mac (including interactive rotation of all 3D graphs, extensive on-screen graph customization facilities) ■ Price: **$395.**

Windows versions also available (can exchange data with Macintosh versions): STATISTICA/w® **$995**; Quick STATISTICA/w® **$495.**

Domestic sh/h $10 per product; please specify type of computer with order; 14-day money-back guarantee.

StatSoft®

2325 E. 13th St. • Tulsa, OK 74104 • (918) 583-4149
Fax: (918) 583-4376

Circle 99 on reader service card

Overseas Offices: StatSoft of Europe (Hamburg, FRG), ph: 040/ 4200347, fax: 040/4911310; **StatSoft UK** (London), ph: 0462/482822, fax: 0462/482855; **StatSoft Pacific** (Melbourne, Australia), ph: (03) 663 6580, fax: (03) 663 6117; **StatSoft France** ph: (1) 45 66 97 00, fax: (1) 45 66 06 51; Available from other Authorized Representatives worldwide: Sweden: AkademiData Scientific ph: 018-210035, fax: 018-210039; Finland: Statcon Oy ph: 24-334678, fax: 24-333867; Belgium: Texma NewTech ph: 10 61 16 28, fax 10 61 69 57; South Africa: Osiris ph: 12-663-4500, fax 12-663-6114; Japan (Macintosh): Three's Company, Inc., ph: 03-3770-7600, fax 03-3770-7784; Japan (Windows): Design Technologies, Inc., ph: 03-3667-1110, fax: 03-3668-3110; Italy: Prompt SRL ph: 49-893-3227, fax: 49-893-2897; Poland: Companion Oprogramowanie ph: 12-369680, fax: 12-360791; Taiwan: Intelligent Integration Corp. ph: 2-759-1791, fax: 2-759-1790.

StatSoft, the StatSoft logo, STATISTICA, and Scrollsheet are trademarks of StatSoft, Inc.

Macworld Online

by Macworld Online Staff

The Internet may hold rich troves for researchers and academics, but it would be a mistake to ignore the online fun quotient. Ever since the first Unix nerds and nerdettes began trading quips via IRC (Internet Relay Chat), the Net has bristled with humor, social commentary, and odd cultural effluvia. Whether logging on to commercial online services or cruising the Web, today's cybernauts are sure to encounter something to tickle their fancy.

Web Fun

Proving that Web browsing can be more fun than a bushel of Net Bunnies, *Macworld Online* offers a spectrum of fun-filled sites. Many of us need our daily Dilbert fix, for instance. Pointing a browser at **http://www.unitedmedia.com/comics/dilbert/** yields the latest escapades of our eponymous hero, along with Dogbert, Wally, and the other cubicle dwellers in Scott Adams's acerbic comic strip about life in the information age.

The Internet Movie Database at **http://www.msstate.edu/Movies/** provides forms for searching films by title, personnel, genre, and other criteria; it also encourages you to add films, enter missing data, and offer your own review. It's egalitarian, eclectic, and very well organized.

Forget Letterman's Top Ten list. The propeller-headed monks that run The Keepers of Lists, a semihallowed Web site at **http://www.dtd.com/cgi-bin/topall**, create a compendium of lists that changes daily. Meander at will; submit new items; vote for your favorites. Our national attempts at democracy should be so fun.

Dave Stanworth's Games Domain at **http://wcl-rs.bham.ac.uk/GamesDomain** is a one-stop cybermall for the digital derring-do set. Gamesters collect FAQs (that's frequently asked questions, in geek speak), tips, and alternative graphics for favorite computer games. The site offers a slew of downloadable demo and shareware game files, too.

The full text of many reference books is beginning to wend its way onto the Web. If you can't recall who intoned, "There is no great genius without a tincture of madness," a quick trip to the Bartlett's Quotations site at **http://www.columbia.edu/~svl2/bartlett/** reveals the author as Seneca. Never be caught without a citation again.

Why wait for the evening news to see if your team won? Log on to ESPNET at **http://ESPNET.SportsZone.com** for the latest scores, schedules, statistics, and trivia.

If you're sick of the commercial suburbanization of the Web, check out Buzznet at **http://www.hooked.net:80/buzznet/**, a 'zine true to the anarchic, creative character of the Net. You'll find music and comic reviews, plus a column on fun antisocial behavior.

LIVE-EVENTS CALENDAR

Macworld Online continues to host real-time digital forums that feature the leading lights in the Macintosh community. We're bringing editors and writers, artists and visionaries directly to your desktop. Please come armed with questions, comments, and critiques. America Online events are on Thursdays, and eWorld events are on Wednesdays. All events are at 6 p.m. Pacific standard time.

Star Trek VR
June 1, AOL
Step on to the bridge of the *Enterprise!* Join the creators of the first QuickTime VR product, Star Trek: The Next Generation Interactive Technical Manual.

Ask Cary Lu
June 7, eWorld
In his monthly *PowerBook Notes* column, contributing editor Cary Lu covers mobile- and remote-computing issues. Online, Cary addresses a wide variety of computing topics.

Deke McClelland
June 8, AOL
If it's a graphics program, chances are good that graphics whiz and contributing editor Deke McClelland uses it. Meet the man who writes the book(s) on Photoshop, Illustrator, and FreeHand.

The Illustrated Mac with Arne Hurty
June 15, AOL
From drawings of carpal-tunnel syndrome to the anatomy of a Power Mac, *Macworld* informational artist Arne Hurty uses his considerable and varied talents to illustrate how things work. Come learn how he does it.

Costa's Clinic
June 21, eWorld
Join Macworld Online's own Steve Costa for a walk-in Mac clinic. Steve helps you tune up your computer, choose great shareware, and get the lowdown on all things Macintosh.

Dilbert's Dad: Scott Adams
June 22, AOL
If you don't make it to this event, be prepared to give up your place in Dogbert's New Ruling Class. Meet cartoonist Scott Adams, creator of the "Dilbert" comic strip and bane of middle managers everywhere.

Jim Heid Q&A
June 29, AOL
Contributing editor Jim Heid has a million Mac tips and tricks up his sleeve. He helps you get the most from your computer—be it a Performa or a Power Mac.

Fun and Games

While you wait for summer's heat to descend, kick back with one of these cool downloadable games from our shareware libraries.

Pac-Man hath begotten a bevy of digital duck-and-dodge-'em offspring, but Kevin Clancy's Super Hac-Man 2 v2.14 is the best of the lot, sporting sprightly sound and vivid color (147K; $7).

If 3-D tank battles are your cup of TNT, Randy Frank's Mac Bzone 1.3.1 should prove worthwhile. Just be sure to hone your reflexes and hand-eye coordination first (100K; free).

Kids should fall for Duan Blehm's Stuntcopter 1.6. Drop a man from a helicopter on high; if he lands on the hay-filled horse cart, hooray. If he doesn't, well, you can always try again (42K; free).

You don't have to buy a ticket to Las Vegas to gamble. Glenn Seemann's Mac Video Poker 1.0.3 lets you pit your card-shark skills against your Mac's (217K; $15).

Exile 1.1's hefty file size may seem excessive, but Jeff Vogel's adventure game offers commercial-quality graphics, cool puzzles to solve, and a slew of characters with whom to interact (1MB; $25).

Don't forget, shareware exists because good Net citizens pay authors good tender for their efforts. **m**

REACHING MACWORLD ONLINE

America Online and eWorld
Keyword is Macworld

The only thing missing is the wait.

New SprintScan 35 Slide Scanner from Polaroid — Brilliant Scans in Under a Minute.

Think of how much more high-quality scanning you'll be able to do at your desk. Or how fast you'll respond to high-volume or last-minute projects. Or even how soon you'll get home.

At under a minute per scan, the SprintScan™ 35 is 5 to 15 times faster than other tested slide scanners, with no loss of quality.* Scanning at resolutions up to 2700 dpi, it samples 10 bits per color (RGB) to deliver the best 24 bits. Which gives you a broader range of colors and better shadow detail. And at only $2,495,† SprintScan 35 won't change the color balance on your bottom line.

Just drop in the slide (positive or negative), point and click. It's that easy. Automatic real-time color processing and image sharpening reduce the need for lengthy post-processing. And it's compatible with both Macintosh and Windows.

The SprintScan 35 Slide Scanner — part of an exciting new line-up of electronic imaging systems from Polaroid.

Don't waste another minute!
For more information call today,
1-800-816-2611 ext. 965.

SprintScan 35 scans slides at 2700 dpi in under a minute.

Polaroid®

* Source: Evaluations by Rich and Associates, June 1994. † Suggested list price. Actual purchase price may vary. "Polaroid" and "SprintScan" are trademarks of Polaroid Corporation.

Circle 295 on reader service card

New Products

THE LATEST MACINTOSH RELEASES

by Jim Feeley
and Joanna Pearlstein

THIS SECTION COVERS MACINTOSH PRODUCTS FORMALLY ANNOUNCED BUT NOT YET EVALUATED BY *MACWORLD*. UNLESS OTHERWISE STATED, ALL PRICES ARE SUGGESTED RETAIL AND THE MINIMUM REQUIREMENTS FOR OPERATION ARE A MAC PLUS WITH 1MB OF RAM, RUNNING SYSTEM 6. A ◀ SIGNIFIES THAT A NATIVE POWER MAC VERSION OF THE PRODUCT IS AVAILABLE. ALL INFORMATION AND PERFORMANCE CLAIMS ARE SUPPLIED BY THE PRODUCT VENDOR AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY *MACWORLD*. PLEASE CALL VENDORS FOR INFORMATION ON AVAILABILITY.

HARDWARE

1724PD

This accelerated QuickDraw graphics board enables many entry-level Macs, including the Quadra 630 and 605 and several Performa models, to drive large monitors at resolutions up to 832 by 624 pixels with 24-bit color, and up to 1152 by 870 pixels with 8-bit color. The board fits into any Mac with an LC III/Quadra 630–type PDS slot and works with most multisynchronous monitors. $499. Micro Conversions, 817/468-9922; fax 817/468-9932.

4-Sight Quatro

What do you do when you need to send 500MB of data across the country and overnight delivery isn't fast enough? The 4-Sight Quatro NuBus ISDN board can attain a data rate of 3.54MB per minute by transmitting files across as many as eight ISDN channels. The board can also simultaneously broadcast files to as many as four independent destinations. $3495; with 4-Sight's ISDN Graphics Superhighway Broadcast software $5795. 4-Sight, 515/221-3000, 800/243-0530; fax 800/448-3299.

AlphaScan SV

The low-cost AlphaScan SV 14-inch monitor offers an active display area of 13.3 inches diagonal, maximum Macintosh resolution of 832 by 624 pixels, a 75Hz refresh rate, and a 0.28mm dot pitch. This Energy Star–compliant monitor includes manual controls for contrast, brightness, and position and shape of the image. $269. Sampo Technology, 404/449-6220; fax 404/447-1109.

AppleCD 600e

Apple's quad-speed CD-ROM drive delivers a 684.4-Kbps streaming data-transfer rate and a 167.5ms average access time. The drive uses a caddyless tray loader, and can play both 3-inch and 5-inch CD-ROMs and audio discs. Starting this summer, an internal version will be included with many Macintosh computers. $349 company's estimated price. Apple Computer, 408/996-1010, 800/538-9696; no fax.

dd.350 and xi.350

dd.350 and xi.350

OK, so you've filled your hard drive with data for an almost-finished multimedia project, but you're already accumulating data for your next project. Now what? The hot-swappable xi stor system lets you easily switch hard drive mechanisms, so you can keep multiple drives available at the ready. The xi.350 Disk Container holds any 3.5-inch SCSI drive from 1.0 to 1.7 inches high. The dd.350 Desktop Dual Docking Station holds one or two disk containers. The company plans to integrate hard drives into its containers soon. xi.350 $140; dd.350 $360. xi stor, 702/824-7777; fax 702/825-3016.

DLT20

Got more data than you can shake a DAT at? The APS DLT20 can pack 20GB of data on a $45.95 DLT CompacTape III data cartridge at a transfer rate of up to 110MB per minute. That's 5 to 10 times as fast as DAT drives. The DLT20 ships with Dantz Development's Retrospect 2.1 and both 50-to-50 and 25-to-50 SCSI cables. $2999.95. APS Technologies, 816/483-6100, 800/235-2753; fax 816/483-3077.

DLT20

EAsycolor 24/1600

EA Research's newest graphics accelerator lets you splash your big monitor with all the colors in the 24-bit rainbow. The EAsycolor 24/1600 supports a maximum resolution of 1600 by 1200 pixels at a 75Hz refresh rate and comes with 8MB of VRAM. In addition to accelerating QuickDraw, the card also speeds up CMYK-to-RGB conversions and Photoshop filter performance. $2499. EA Research, 510/867-0967, 800/681-6566; fax 510/867-0684.

KeyStone

Macintosh users often complain that PC users have so many more ergonomic keyboards, mice, and joysticks to choose from. KeyStone lets Mac people hook up almost any PC AT–compatible input device, including Microsoft's popular Natural keyboard, to a Mac via the ADB port. The converter box doesn't disable existing ADB devices, and a control-panel device enables most PC keyboards to duplicate the functions of the Mac's special keys. $99. Silicon Valley Bus Co., 408/623-2300, 800/775-0555; fax 408/623-4440.

PowerPort Platinum and TelePort Platinum

If you've spent any time visiting the Web or an ARA server recently, you know the advantages a fast modem provides. Global Village's V.34 fax modems move data at 28.8 Kbps and faxes at 14.4 Kbps. The TelePort Platinum works with desktop Macs, while the PowerPort Platinum fits in all 100-series PowerBooks. Both modems include GlobalFax 2.5 software. TelePort Platinum $279; PowerPort Platinum $399. Global Village, 408/523-1000, 800/736-4821; fax 408/523-2407.

Presenter 101

The Presenter 101 active matrix projection panel incorporates an 8.4-inch LCD with 640-by-480-pixel resolution and support for more than 185,000 colors. Weighing just 4.3 pounds, the portable panel uses a single cable to connect to either PC or Macintosh computers. The 3-by-4-inch control panel lets the user adjust the image without projecting a distracting menu on top of the presentation. $2795. nView, 804/873-1345, 800/736-8439; fax 804/873-2153.

RFS 3570

RFS 3570

The Kodak RFS 3570, a 36-bit slide scanner, quickly digitizes color negatives and transparencies as large as 70mm at resolutions ranging from 800 to 2000 dpi. The speedy RFS 3570 scans a 35mm image at 2000 dpi in less than a minute. A 120-format image at 900 dpi takes less than two minutes. The scanner also features autofocus and automatic color-balancing. $8995. Eastman Kodak, 714/726-7260, 800/235-6325; no fax.

SyncMaster 15GLi and 17GLi

These monitors automatically find the optimum pixel resolution and refresh rate that your Mac or graphics card supports. The 15-inch and 17-inch SyncMasters offer on-screen adjustment of screen geometry, image size, pincushion, and color temperature. Both antiglare coated monitors offer a 0.28mm dot pitch and a maximum Macintosh pixel resolution of 1024 by 768 at a 76Hz refresh rate, and both comply with Energy Star and MPR II guidelines. 15GLi $560; 17GLi $849. Samsung Electronics America, 201/229-4000, 800/993-4110; fax 201/229-4069.

SyncMaster 17GLi

continues

If you spend your day creating with Media-Publishing applications then you need the maximum in speed and productivity. If you make your living at graphic design, page layout, prepress, 3D, animation or multimedia, DayStar's PowerPC upgrades are just what you need to make your aging Mac brand new again. From early '030 Macs to Quadras, name your Mac and we'll speed it up.

Goodbye, Grunt Work...

Creative people spend too much time watching the progress bar. "Rendering. Please Wait...", "Compressing Movie...", "Building Preview..." Remember when Macs were supposed to make your publishing go faster?

DayStar puts productive power back into your desktop Mac. You can render, compress, edit, preview, produce – up to 32 times faster with a DayStar upgrade.

The faster your Mac slices through difficult tasks, the more time you can spend developing your ideas.

Hello, Creativity!

DayStar upgrades enhance your creativity by speeding everything you do. Make more complex graphics, images and 3D scenes. Get higher frame rates. With a DayStar upgrade, all limitations on your creativity are now history!

Plug In To Power

And now we're building a Mac™ OS-compatible with all the speed and performance that Media-Publishers like you need. It's called DayStar Genesis MP... stay tuned for the latest developments in speed and watch how we increase your productivity, with DayStar!

DAYSTAR DIGITAL

For more information call 800-962-2077

Press 4# to order FaxBack documents. Then press 1# for Faxback Catalog.

DayStar Digital, Inc., 5556 Atlanta Highway, Flowery Branch, GA 30542
404-967-2077 Fax: (404) 967-3018 FaxBack: 800-438-0370

©1995. All brands and product names are trademarks or registered trademarks of their respective holders. Product specifications are subject to change without notice or obligation.

Circle 7 on reader service card

TruePoint-DP15

If that Photoshop image of your grandkid is so cute that you want to reach out and pinch the tyke's cheek, then consider the TruePoint-DP15 Touch Monitor. MicroTouch's proprietary capacitive-touch technology responds to fingertip taps through up to two inches of glass. This 15-inch, 0.28mm dot-pitch monitor, aimed at kiosk, industrial, and multimedia markets, supports Mac pixel resolutions up to 1280 by 1024 at a 60Hz refresh rate. $1445. MicroTouch, 580/659-9000, 800/642-7686; fax 508/659-9100.

SOFTWARE

1995 Maui Golf Guide

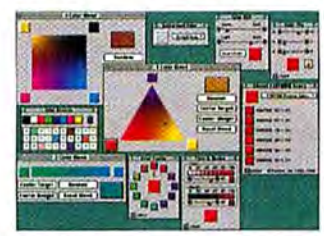
Don't have the cash for a Hawaiian fantasy vacation? Relax, now you can tour 14 of Maui's golf courses—including Grand Waikapu, Kaanapali North,

1995 Maui Golf Guide

Kaanapali South, Kapalua Bay, Kapalua Plantation, Kapalua Village, Maui Country Club, and Pukalani Golf Club—from your desk. The Golf Guide text and graphics describe every hole of each course, including rates, course designers, greens fees, and driving ranges. Requires 4.5MB of RAM, System 7, high-density floppy drive. $29.95. Precision Guides, 503/227-6219, 800/580-5050; fax 503/227-4888.

Color Compass

The days of trying to manually match your Adobe Illustrator colors to your Fractal Design Painter colors are over—at last. Praxisoft's Color Compass lets you create custom color palettes for use with Painter and Illustrator, Adobe Photoshop, and Macromedia's Director and FreeHand. When users create a custom color, Color Compass instantly displays all similar, complementary, and Pantone-equivalent colors. Requires 68020-based Mac with FPU, System 7. $129. Praxisoft, 703/729-3391, 800/557-7294; fax 703/729-6875.



Color Compass

Co-motion Lite for Internet

The Internet just got more useful: groupware for the Internet is here. Co-motion Lite lets users with direct connections to the Net brainstorm and collaborate in group sessions. Each participant's comments are contained in the live Session window. Users can create reports from sessions. Statistical functions permit response analysis by averaging and calculating standard deviations for each idea. Requires 4MB of RAM, System 7, MacTCP, Internet connection. $2000 custom license; $78 for evaluation ten-pack. Bittco Solutions, 403/922-5514, 800/265-2726; fax 403/922-2853.

FrameMaker 5.0

New features of FrameMaker 5.0 include automatic text runarounds, enhanced import filters, automatic column balancing, straddles, support for Adobe Type 1 fonts, and an export filter for HTML publishing (see "Web Design Spins Up," *News*, in this issue). Requires 68020 Mac, 5MB of RAM, System 7.0.1; System 7.1.2 required for Power Mac version. $895. Frame Technology, 408/975-6000, 800/843-7263; fax 408/975-6600.

Fuzzy Logic Toolbox 1.0

We've heard of gray-scale monitors, but gray-scale reasoning? Rather than limiting information to two states such as true/false, yes/no, or on/off, fuzzy logic accommodates relative attributes such as "louder," "faster," and "slippery." This MATLAB add-on toolbox lets engineers and researchers integrate the concepts of fuzzy logic into their systems. Still confused? Visit MathWorks' home page at **http://www.mathworks.com**. Requires Mac II, 8MB of RAM, MATLAB. $895. MathWorks, 508/653-1415; fax 508/653-2997.

Kodak Build-It Software for the Macintosh

Kodak Build-It Software for the Macintosh

Kodak's Photo CD authoring system, Build-It, puts your pictures on view anywhere there's a compatible CD-ROM drive. The product lets you convert TIFF, PICT, and Photoshop images to the Photo CD Image Pac format, and then store and distribute them via CD-ROM. The package includes color-management tools. For more information, visit Kodak's Web site at **http://www.kodak.com**. Requires 68040-based Mac, 64MB of RAM, Photo CD–compatible, double-speed CD-R drive, System 7; FWB JackHammer SCSI card recommended. $995. Eastman Kodak, 800/235-6325; no fax.

KPT Vector Effects

Users of draw programs need no longer covet the effects their Photoshopping colleagues enjoy. KPT Vector Effects takes advantage of the plug-in architectures now available in Adobe Illustrator and Macromedia FreeHand to enhance drawings with effects including 3-D, distortion, bevel embossing, extrusion, perspective distortion, and stylization. Requires 68030 Mac with FPU, or Power Mac, 4MB of RAM, 8-bit color, Adobe

continues

No Smoke, No Mirrors, Just...

Introducing XANTÉ's **NEW** LaserPress 1800

No hocus-pocus. Nothing up our sleeves. At XANTÉ® we're creating technology so advanced—it's truly magical. XANTÉ's NEW LaserPress 1800 produces camera-ready output so vivid and sharp, *you won't believe your eyes.* Text is rendered in exceptional detail, graphics look sharp, and halftones appear photo-realistic. You'll be spellbound by the quality of 1800 x 1800 dpi printing. No smoke, no mirrors, just:

- ★ **Adobe™ PostScript™ Level 2** Guarantees quality, performance, and software compatibility
- ★ **High Resolution** 1800 x 1800 dpi provides imagesetter-quality printing on plain paper
- ★ **Higher Line Screens** Print halftones at 133 lpi and higher
- ★ **Oversized Format** Print full-bleed 11"x 17" documents with room for crop marks and registration marks
- ★ **Halftone Calibration Technology** Brings out a greater range of midtones at high line screens and extra detail for more brilliant halftone images
- ★ **High Speed Controller** Get extraordinary performance from the 33 MHz AMD 29030 RISC processor

Also, XANTÉ reduces the price of its LaserPress 1200...

That's right, for **$5,995** you can get 1200 x 1200 dpi now and upgrade to 1800 x 1800 dpi later. What a deal!

Now, clear the smoke and begin to experience true reflections of quality with XANTÉ's LaserPress 1800. Call now and *experience the magic of great technology.*

1-800-926-8839 (ext. 2119) Dealers call ext. 2120 Fax 334-476-9421

AT&T Capital Corporation

Optional on-site service provided by XANTÉ, in partnership with Olivetti North America

olivetti

XANTÉ *Innovations In Output*

* Additional memory is required to print 11" x 17" pages at 1800 x 1800 dpi.

MASTERCARD/VISA/AMEX/DISCOVER

Adobe PostScript

©1995 XANTÉ Corporation. XANTÉ is a registered trademark of XANTÉ Corporation. Adobe, PostScript and the PostScript logo are trademarks of Adobe Systems Incorporated which may be registered in certain jurisdictions. Other brands and product names are trademarks or registered trademarks of their respective holders.

XANTÉ Corporation: 2559 Emogene St., Mobile, AL 36606, Post Office Box 16526, Mobile, AL 36616-0526 USA, Tel. 334-476-9189

Circle 112 on reader service card

Illustrator or Macromedia FreeHand. $199. HSC Software, 805/566-6200, 800/472-9025; fax 805/566-6385.

Mangia 1.2

Mangia 1.2
Move aside, Julia Child, Jacques Pepin, and Craig Claiborne—make room for Mac. The latest version of Mangia, Upstill Software's kitchen companion, has enhanced speed, fonts, and print capabilities. Add-on cookbooks are also available, including *Tassajara Recipe Book, Good Cheap Food, Eat Smart for a Healthy Heart, One-Pot Meals, Fifteen Minute Meals, Elegant Low-Calorie Cooking,* and *Thirty-Minute Meals.* (Hey, cookbook publishers: how about *Cheap, Elegant, Low-Calorie, Healthy, One-Pot, 15-Minute Meals?* Thanks.—Eds.) Recipes can be formatted to print as booklets or recipe cards. $35 company's estimated price; add-on cookbooks $10 to $20 each. Upstill Software, 510/526-0178, 800/568-3696; fax 510/526-0179.

Marketing Plan Pro
Marketing Plan Pro helps users create and manage marketing strategies. It walks the user through each critical step, from analyzing the marketplace and choosing target markets, to making budgets and sales forecasts, to devising advertising, public relations, and direct-mail campaigns. After helping you create a complete marketing plan with text, tables, and charts, the product can assist in managing tasks, supervising follow-up, and tracking results. Marketing Plan Pro contains built-in spreadsheet, charting, and word processing software. Requires 6MB of RAM, System 7. $149.95; Power Mac version $179.90. Palo Alto Software, 503/683-6162, 800/229-7526; fax 503/683-6250.

NetPhone
Ever dream of calling a friend in Calcutta from your home in Cleveland for the price of a local call? Electric Magic makes this dream come true. The company's NetPhone transfers audio over the Internet in real time. It records audio on one side, compresses it, sends it over the Internet, and decompresses it on the receiving end. The application notifies you when you have an incoming call. Demo versions are available from the company's World Wide Web site at **http://www.emagic.com/**. Requires Mac IIsi, 4MB of RAM, System 7, MacTCP, Internet connection. $75; two copies $125. Electric Magic, 415/759-4100, 800/987-2001; fax 415/566-6615.

PathWay Access, Macintosh 3.0
Wollongong Group's PathWay Access makes TCP/IP connectivity not only easier, but also more enticing. Version 3.0 includes applications for terminal emulation, E-mail, and file transfer, as well as a news reader, a script compiler, and a graphical keyboard remapper. The package also supports remote access via PPP. Requires Mac SE/30, 4MB of RAM, System 7. $295. Wollongong Group, 415/962-7100, 800/872-8649; fax 415/969-5547.

Smartslip and Smartslip Tracker
Wondering where that crucial document went? Used together, Smartslip and Smartslip Tracker constitute an electronic routing-slip system. Smartslip users can attach an electronic routing slip to documents sent via Microsoft Mail, CE Software's QuickMail, or Apple's PowerTalk mail systems. Smartslip Tracker helps find a document being circulated. Smartslip includes four types of routing slips—Review, Approval, Yes/No, and Sign-up—or you can design your own slips. Requires 4MB of RAM, System 7; Tracker requires Butler database. Smartslip five-user pack $395; Smartslip and Smartslip Tracker five-user pack $495 (does not include Butler database). ChorusSoft, 408/736-4024; fax 408/720-1949.

SuperOffice 3.0
Get your entire enterprise organized—the client-server way. The powerful database in SuperOffice 3.0 lets you schedule appointments, record information about companies and accounts, track activities, and create reports. You can also link documents scanned by Visioneer's PaperPort personal scanner to records in the database. New in this version are the user's ability to define database fields; multiple calendar views; event alarms; international address and phone formats; and built-in help. Requires 6MB of RAM, hard drive. $219 for single-user pack. SuperOffice, 617/275-2140, 800/328-6868; fax 617/275-6921.

TurboWriter and Shasta
Make your Mac multilingual. This word processor and dictionary, delivered on a CD-ROM, lets you communicate in five Asian languages—Japanese, traditional Chinese, simplified Chinese, Thai, and Tibetan. The word processor offers mail merge, multiple columns, in-line table creation and editing, vertical text, custom styles, page preview, a PageMaker file-import filter, and Claris XTND support. Shasta is a dictionary and word-by-word translation tool for English, Japanese, and traditional Chinese. A dictionary editor lets you create your own dictionaries. Requires CD-ROM drive, localized system software or language

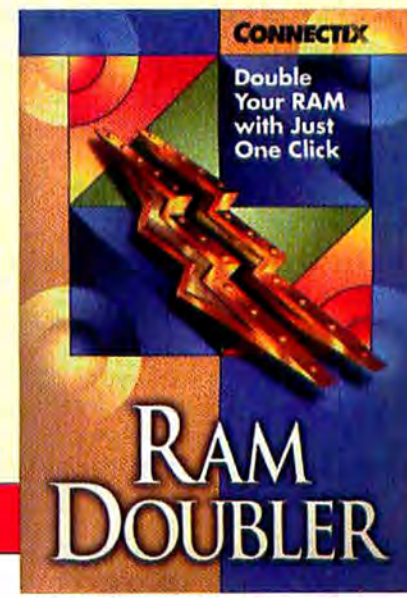
continues

TurboWriter and Shasta

What Do You Say When You're Out Of Memory?

I need RAM Doubler.

The more memory your Mac has, the more productive you'll be. But forget about adding SIMMs. RAM Doubler™ is software that doubles your Mac's memory. *RAM Doubler does what it says it will do.~Macworld.* And you don't have to open your Mac. Just run RAM Doubler's 15 second installation and you can run twice as many applications – instantly. *May well be the best investment you make this year.~MacUser.* You'll agree. Buy RAM Doubler today and double your RAM with one click. Your satisfaction is guaranteed. RAM Doubler is available wherever great software is sold (SRP $99) or call us at **1-800-950-5880, Ext. 280.**



CONNECTIX

System Requirements: Macintosh equipped with a 68030, 68040 or PowerPC microprocessor. System 6.05 or later, including all versions of system 7 • 4 MBs required (hard disk required for machines with 4 to 6 MBs) • Not compatible with Mac SE, original Mac Classic, original Mac LC or PowerBook 100 or Mac II without a 68851 PMMU or any accelerator that does not work with virtual memory.

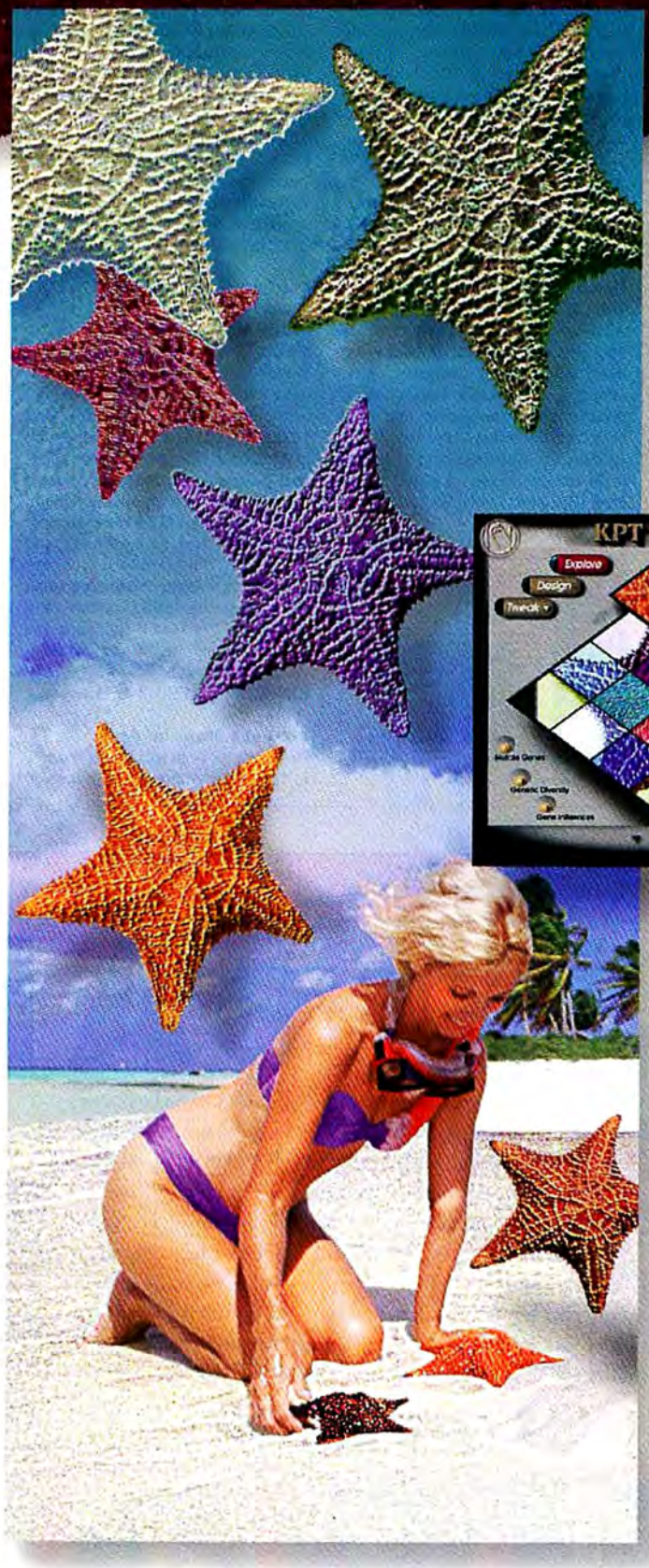
© 1995 Connectix Corporation. 2600 Campus Drive, San Mateo, CA 94403 USA. 800-950-5880 • 415-571-5100 • FAX: 415-571-5195
EMAIL: Support@connectix.com • RAM Doubler is a trademark of Connectix Corporation. All other trademarks are the property of their respective holders.

Circle 192 on reader service card

KPT Convolver™ BRINGS OUT THE STARS!

Power Macintosh
Macintosh
Windows NT
Windows

Accelerated for Power Macintosh



Plug in KPT *Convolver*. It's the ultimate creative filter effects palette and the only software that actually rewards you for using it...with *stars and tools*!

It's Kai's latest plug-in for creative and corrective work. You'll find it essential for cleaning up that muddy scan or bringing out hidden beauty in any image.

KPT *Convolver* gives you millions of custom filter effects at the blink of an eye. Powerful unsharp masking and Gaussian blurring in real time. Scrubbing between two effects at once. Two hundred levels of undo. Superb color correction tools.

All this without making you search endless dialog boxes or fill in streams of matrices. With KPT *Convolver*, select an effect, then move your mouse until things are just right. Three distinct modes lead you through the entire creative process. All in real time. It couldn't be simpler!

Plug-in ready for Photoshop, Painter, Picture Publisher and Corel PHOTO-PAINT users, KPT *Convolver* is already being called the most useful KAI'S POWER *Tool* so far. It even comes with an award-winning paint and image editing program (up to $199 value), making KPT *Convolver* your complete standalone solution.

Best of all, KPT *Convolver* watches how you work. Then *ping*!, it rewards you with a star plus a cool feature to help you work better and faster.

Be the first on your digital block to collect all five stars and watch your productivity really skyrocket!

How do you earn each *star*? Ah, we're not telling! But that's part of what makes KPT *Convolver* so much fun to explore and use! So put it in your digital tool box and watch the stars come out.

FREE!
Mac version includes Color-It! 3.0 LE
Windows version includes Picture Publisher LE

ORDER TODAY!
Computerware
800-326-0092

Mac Zone
800-248-0800

MacWarehouse
800-255-6227

SEE US AT:
Siggraph, Los Angeles
Aug. 8-10, Booth #1244

Macworld, Boston
Aug. 8-11, Booth #1916

Plus upcoming COMDEX and Seybold shows

Seybold Editors' WINNER AWARD FOR EXCELLENCE '95

MacUser WWW

MacWEEK JANUARY 1995

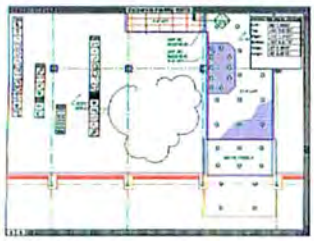
©1995 HSC SOFTWARE CORP. HSC IS A REGISTERED TRADEMARK AND KPT CONVOLVER IS A TRADEMARK OF HSC SOFTWARE CORP. MACINTOSH IS A REGISTERED TRADEMARK AND POWER MACINTOSH IS A TRADEMARK OF HSC SOFTWARE CORP. USED UNDER LICENSE. ALL OTHER PRODUCT NAMES ARE TRADEMARKS OF THEIR RESPECTIVE OWNERS.

HSC SOFTWARE

HSC *Software Corp.* 6303 *Carpinteria Ave., Carpinteria, CA 93013 phone* 805.566.6220 *fax* 805.566.6385

Circle 5 on reader service card

kit. $295. Transpac, 408/261-7550, 800/745-0911; fax 408/984-6303; Japanese product sales 800/882-8856.



WildTools

WildTools
WildTools is a high-end tool palette for Engineered Software's PowerDraw and PowerCADD. It includes powerful illustration, drafting, and dimensioning tools. Advanced tools let you measure from point to point, place a centerline at the midpoint of two lines, and automatically switch between fixed-offset and interactive operation. You can zoom in on and out of images and can adjust the method of drawing. Requires PowerDraw 5.0 or PowerCADD 1.0. $189. Engineered Software, 910/299-4843, fax 910/852-2067.

CD-ROMS

Haight-Ashbury in the Sixties
If you missed the sixties the first time around, don't be dismayed. Now you can be a virtual hippie with Compton's Haight-Ashbury in the Sixties. This CD-ROM features music of the Grateful Dead and Jefferson Airplane, plus video clips from the first Human Be-In in San Francisco's Golden Gate Park and interviews with cultural icons Allen Ginsberg and Timothy Leary. Subtitled "San Francisco's Renaissance of Peace Love Consciousness & Community That Changed the World," the disc includes an adventure game that lets users explore Haight Street and different aspects of hippie youth culture. $50 company's estimated price. Compton's NewMedia, 619/929-2500, 800/284-2045; fax 619/929-2600.

Her Heritage
This CD-ROM encyclopedia of famous American women contains information about more than 1000 American athletes, writers, artists, politicians, entertainers, and educators. Entries include photographs, drawings, film and video clips, and interviews. Profiles of the women are organized both alphabetically and by vocation. $49.95. Pilgrim New Media, 617/491-7660; fax 617/491-6415.

Her Heritage

License To Drive
You don't have to give your teenager the keys to the Volvo to teach him or her how to drive anymore. Janus Interactive's driver-education CD presents drivers' manuals for all 50 states, plus sections titled Getting Your License, The Driver's Role, Vehicle Equipment, Rules of the Road, Signs & Signals, Driving Situations, Defensive Driving, Sharing the Road, Pedestrians, Alcohol & Driving, Traffic Infractions, and Accidents. Each section has a quiz at the end. $89. Janus Interactive, 503/629-0587, 800/766-0835; fax 503/690-6690.

Macintosh Programmer's Toolbox Assistant and Inside Macintosh
Manna for Mac programmers! Users of Inside Macintosh can consult programming information from all 25 volumes of the *Inside Macintosh* library (over 16,000 pages), plus the digital version of *Macintosh Human Interface Guidelines*. Among hundreds of topics covered are file and memory management; imaging with QuickDraw; networking; SCSI, serial, and ADB devices; and QuickTime. The Macintosh Programmer's Toolbox Assistant has information about more than 5000 toolbox calls. Both CDs have search functions and hypertext linking. $99.95 each. Addison-Wesley Publishing, 617/944-3700, 800/822-6339; fax 617/942-1621.

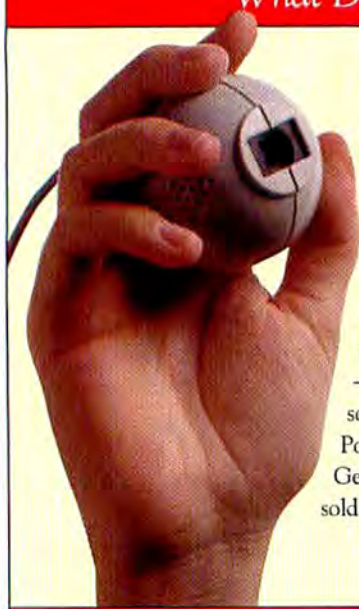
PC Globe Maps 'n' Facts
Planning a move to Mauritania or a trek to Tripoli? Better research your destination first using PC Globe Maps 'n' Facts. In addition to more than 300 color and black-and-white maps and charts of the world, this CD-ROM contains information on political alliances, population, geography, economics, and national symbols for 227 countries. You can compare prices in other countries with a currency converter, look up visa requirements for various destinations, and find phone numbers for U.S. embassies around the world. $32 company's estimated price. Brøderbund Software, 415/382-4700, 800/776-4724; fax 415/382-4419.

ACCESSORIES

Companion Case
If you're tired of unpacking half your travel kit just so you can use your PowerBook, notepad, and papers at the same time, consider an alternative. By opening one zipper of the Portfolio Companion case, you can easily work with your computer, your papers, and a letter-size tablet. The leather case has pockets for disks, pens, business cards, and folders. $129. Lighthorse Technologies, 619/452-8876, 800/443-3446; fax 619/483-1196.

Data-Vac Electric Duster
Eating sugar donuts at your workstation again? Well, Homer, the Electric Duster is designed to blow dust, lint, and debris off fax machines, printers, and other sensitive electronic equipment. The duster *continues*

What Do You Do With A $100 Digital Video Camera?



Have A Ball.

QuickCam™ includes everything you need to make movies and take pictures with your Mac. Plug in one cable, install the software and you're ready to roll. Add still photos to documents, newsletters, databases. Record QuickTime® training movies, video conference, create animated cartoons – all for around $100. Works with all QuickTime compatible software and on all QuickTime compatible Macs, including PowerBooks®. It's easy, fun, and your satisfaction is guaranteed. Get your QuickCam today where fine computer products are sold or call us at **1-800-950-5880, Ext. 280.**

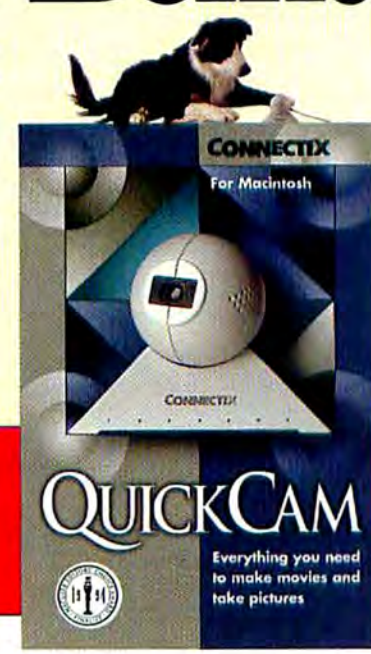
CONNECTIX

MAKE MOVIES

VIDEO CONFERENCE

TAKE PICTURES

BE CREATIVE



© 1994 Connectix Corporation. 2600 Campus Drive, San Mateo, CA 94403 USA. 800-950-5880 • 415-571-5100 • FAX: 415-571-5195. QuickCam is a trademark of Connectix Corporation. QuickTime and PowerBook are registered trademarks of Apple Computer, Inc. All other trademarks are the property of their respective holders.

Circle 191 on reader service card

10 REASONS WHY *now* IS THE BEST TIME TO BUY ADOBE PAGEMAKER 5.0.

You'll create everything from award-winning brochures ❶ and publications ❷ to promotional materials ❸ and company mailers ❹. Adobe PageMaker™ 5.0 ❺ software's unmatched precision and control combined with a naturally intuitive interface have made it the leader in desktop publishing for Power Macs™, Macintosh® and Windows®. It also gets kudos from editors of Windows ❻ and Mac publications ❼ alike. And now, for a limited time, you even get Extensis Page Tools ❽ free, to make Adobe PageMaker work faster, easier and more efficiently. What's more, you also get 220 free Adobe Type 1 fonts on the Type On Call CD-ROM ❾ which contains more than 2,000 encrypted fonts, just a phone call away. Adobe PageMaker 5.0 is now part of the Adobe ❿ family of award-winning products. For more information and your nearest Adobe Authorized Reseller, call 1-800-521-1976, Extension G1261.

Adobe

If you can *dream* it, you can *do* it.™

Image credits: Art Institute of Boston, Minelli Design, Mirelez/Ross, WYD Design. Adobe, the Adobe logo, Adobe PageMaker, and the tagline, "If you can dream it, you can do it" are trademarks of Adobe Systems Incorporated which may be registered in certain jurisdictions. All other marks and trademarks are the property of their respective companies. The Adobe PageMaker package is the protected trade dress of Adobe Systems Incorporated.
© 1995 Adobe Systems Incorporated. All rights reserved.

Circle 231 on reader service card

has a half-horsepower blower, a 12-foot power cord, and two nozzles. $49.95. The Data-Vac division of Metropolitan Vacuum Cleaner, 914/357-1600, 800/822-1602; fax 914/357-1600.

The Mouse Rest Wrist Support
If gripping your mouse hurts your wrist, ErgoView says it can help. The company claims that the Mouse Rest minimizes wrist strain by correctly positioning your wrist in a laterally and horizontally neutral position. Available for right and left hands, the cushioned Mouse Rest has a washable fabric cover. $12.95. ErgoView Technologies, 212/867-0661, 800/888-3537; fax 212/867-2559.

Neptune
No, *ulva rigida* isn't the condition tenors get when their voices seize up. Rather, it's an Italian sea plant harvested in the Venice Lagoon and included in Neptune, a smooth 80-pound text-weight paper (32-pound bond) aimed at the desktop and quick-print market. The company says converting seaweed into paper requires less energy than making paper from trees. Informal *Macworld* testing reveals that the paper neither smells nor tastes like a tide pool. The paper is available in five lightly speckled colors and several sizes. $14.95 for a 100-sheet box of 8½-by-11-inch paper. Four Corners Paper Company, 602/991-2320, 800/775-2320; no fax.

QV-10
How can you know if the picture you just took with your digital camera is any good? Casio's QV-10 digital camera includes a 1.8-inch-diagonal LCD color screen that lets you view images immediately after shooting them. The camera holds up to 96 color images, and offers aperture-priority automatic exposure and shutter speeds ranging from 1/4000 second to 1/8 second. The images can be downloaded to a computer, VCR, or TV. Also includes a self-timer and exposure-correction, close-up, and macro functions. $999 including Mac connection kit. Casio, 201/361-5400, 800/962-2746; no fax.

Scream Computer Mouse Pad
Preserve decorum while expressing your despair with this mouse pad featuring a reproduction of Edvard Munch's painting The Scream. The 7¼-by-9¼-inch pad has a durable plastic surface atop a natural rubber base. $18. On The Wall Productions, 314/773-1939, 800/788-4044; fax 314/773-3446.

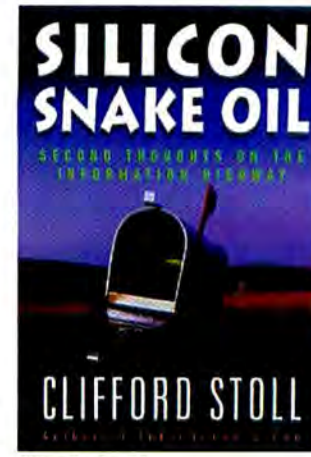
BOOKS

Photoshop 3 For Mac For Dummies
With humor and expertise, *Macworld* contributing editor Deke McClelland guides the graphically challenged through Photoshop's maze of features. McClelland covers retouching bad scans and out-of-focus pictures, preparing images for professional printing, and creating art with Photoshop. The book is aimed at beginning to intermediate users. 339 pages. $19.99. IDG Books Worldwide, 415/655-3000, 800/762-2974; fax 415/655-3299.

The Power Mac Book
Ron Pronk tells readers how to get the most out of their Power Macs and Power Mac software. He discusses troubleshooting, running Windows software on a Power Mac, and the future of the Power Mac. The book includes a CD-ROM of shareware and demonstration software. 395 pages. $34.95. Coriolis Group Books, 602/483-0192, 800/410-0192; fax 602/483-0193.

Protect Your Privacy
PGP (Pretty Good Privacy), Phil Zimmerman's free encryption program, provides individuals with public-key cryptography similar to that used by governments and large corporations. William Stallings' *Protect Your Privacy* explains how to use PGP to keep your private messages private. This book guides you through basic concepts in cryptography and tells you how to use and manage PGP on various computer platforms, including the Macintosh. 300 pages. $19.95. Prentice-Hall, 515/284-6751, 800/947-7700; fax 515/284-2607.

Silicon Snake Oil
Clifford Stoll, one of the original Internauts, has some second thoughts on the information highway. His concerns aren't about increased government control over our lives. Rather, he worries that the Internet offers "plenty of human contact but no humanity." Although Stoll still frequents the Internet, he thinks that huge amounts of money and time are wasted in an attempt to keep up with technology and information that has little long-term value. 247 pages. $22. Doubleday, 212/354-6500; fax 212/302-7985. m



Silicon Snake Oil

To have your product considered for inclusion in *New Products*, send an announcement with product name, description, minimum memory, peripherals required, pricing, company name, and phone number to New Products Editor, *Macworld*, 501 Second St., San Francisco, CA 94107. *Macworld* reserves the right to edit all product announcements.

At Last! The Definitive Reference to Image Editing with Adobe Photoshop 2.5

National Bestseller

16-Page Full Color Photoshop Gallery Inside!

30 Day No Risk Guarantee
Try this book for 30 days at absolutely no risk. If it doesn't help you get more out of Photoshop, return it for a full refund.

MACWORLD PHOTOSHOP 2.5 BIBLE GUIDES YOU EXPERTLY THROUGH ELECTRONIC PAINTING, RETOUCHING, SPECIAL EFFECTS, AND MORE!

Now even novices can explore the creative possibilities of this highly sophisticated graphic design program in a book written expressly for Photoshop 2.5. Author Deke McClelland draws on years of hands-on experience to guide you from Photoshop fundamentals through the most advanced techniques, including retouching and complex electronic imaging. Concise, well-organized chapters cover key topics such as getting the most out of Photoshop; working with image file formats; resampling and cropping; paint and edit tool basics; color manipulations, and more.
Get the *Macworld Photoshop 2.5 Bible*, the only Photoshop book officially authorized by *Macworld* magazine, and see what great things you can do with this leading design program!

A contributing editor to *Macworld* magazine, Deke McClelland also writes for *PC World* and *Publish*. He has authored nearly 30 books on desktop publishing and computers.

ISBN: 1-56884-022-5
$29.95 USA/$39.95 Canada
690 pages

IDG BOOKS
IDG Books Worldwide, Inc.
155 Bovet Road, Suite 310, San Mateo, CA 94402
(800) 762-2974, (415) 312-0600 Fax (415) 358-1260

Order Risk-Free: 1-800-762-2974

For fastest service, fax your order to (415) 358-1280. Phone 8am to 5pm, PT, or complete and mail the order form. Also available wherever computer books are sold.

Yes! Please send me:

	Qty.	Price	Total
Macworld Photoshop 2.5 Bible		$29.95	
UPS shipping & handling add		4.00/book	
Inquire about Rush delivery at extra charge		Rush	
CA residents add applicable county tax, IN & MA residents add 5% tax, MI residents add 6% tax, IL residents add 6.25% tax, Canadian residents add 7% GST tax.		Tax	
		Total	

For volume discounts and special orders, please call Tony Real, Special Sales, at 415-312-0644.

I Wish to Pay by:
❑ Check
❑ Visa/MC
❑ Amex
No CODs, U.S. funds only; payment must accompany order.

Card No. (include all numbers) Exp. Date
Signature (necessary to be valid)
Name Company
Street City State Zip
Area Code Phone Number
MWB94

SULLIVAN MIDDLE SCHOOL

JUST ONE OF THE 1.4 MILLION SATISFIED QUICKMAIL CUSTOMERS WORLDWIDE

ANOTHER ONE IN A MILLION

QuickMail continues to win awards and receive high ratings. Like four "diamonds" from MacWEEK. Or the readers of Macworld selecting it as the best E-mail system in 1994. But the true measure of success is the millions of satisfied customers, like Sullivan Middle School, who depend on QuickMail every day.

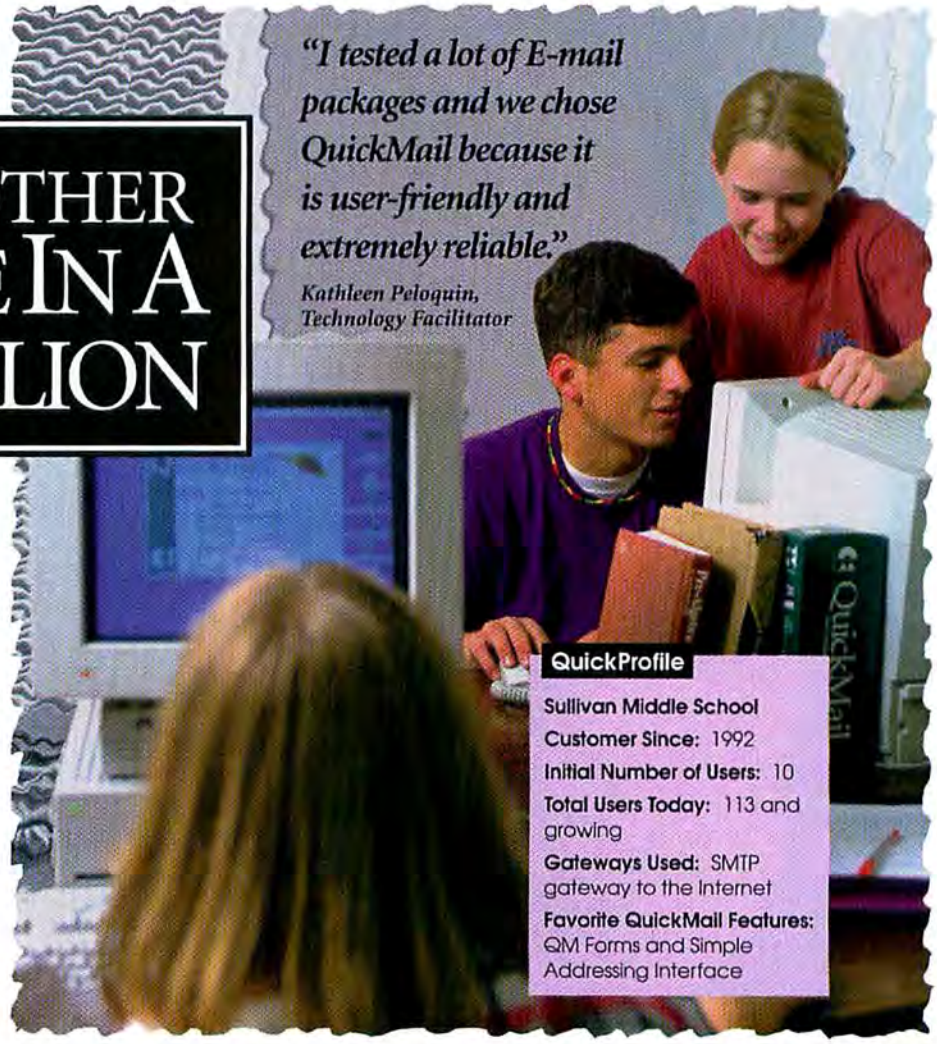
With more than one hundred classrooms, and nearly 1,000 students, Sullivan Middle School in Worcester, MA., wanted to create an efficient, paperless environment using state-of-the-art technology to streamline processes, reduce overhead, and improve communications.

To accomplish this, Sullivan Middle School turned to QuickMail. *"I tested a lot of E-mail packages and we chose QuickMail because it is user-friendly and extremely reliable,"* states Kathleen Peloquin, technology facilitator at the school.

With more than 300 computers on the network, Sullivan Middle School has computers in every classroom. Messages are sent throughout the building, eliminating frequent and frantic searches for information on students and activities. Paper-based business processes have been automated using QuickMail electronic forms and an SMTP gateway connects everyone to the Internet. *"QuickMail does the one thing we really need to do… save time, energy, and money," notes Peloquin.*

"Today, QuickMail is the main communication tool for teachers, administrators, and staff. But we don't plan to stop there. It will be fantastic when we give each student a QuickMail account! That's our next step."

Put QuickMail to work for you!
Streamlined communications, efficient file transfers, and the ability to conveniently and inexpensively communicate across the hall and around the world – that's QuickMail.



Discover why more than 1.4 million customers (like Sullivan Middle School) selected QuickMail. Complete the order form and we'll send you QuickMail absolutely FREE.

With this offer you will receive a comprehensive E-mail system including:

- Easy-to-install E-mail server and administrator software
- Clients for Mac, Windows, and DOS
- MailManager™ (rules), to simplify mailbox management
- QM Remote™ to send and receive E-mail from the road
- QM Forms™ to create custom forms
- QuickConference™ to communicate in real time on-screen
- Built-in spell checker and powerful searching capabilities
- Free bridges and gateways

FREE CD-ROM includes $500.00 of Software!

No other E-mail system on any platform delivers all this in one box.

YES! Send me a complete QuickMail system – FREE!
Fax to 515-221-2694 or Call 1-800-523-7638 Program CE733

Name _____
Company _____
Address _____
City/St /Zip _____
Phone _____
Fax _____
E-mail _____

☐ **Charge $9.95 for shipping & handling for CD-ROM***
☐ **Charge $19.95 for shipping & handling for Disk Package****
☐ MasterCard ☐ VISA ☐ AMEX
Card # _____ Exp.Date _____
Cardholder Signature _____
Offer expires June 30, 1995

*Each CD-ROM includes all software that is standard in QuickMail packages and allows you to set up three full working users. **The disk package includes all QuickMail software and documentation, but does not contain the additional software found on CD-ROM. Current QuickMail customers are not eligible for this CD-ROM promotion. Offer valid only in the United States and Canada. Limit one CD-ROM per local call. ©1995 CE Software, Inc. QuickMail is a trademark of CE Software, Inc. All other trademarks or registered trademarks are the sole property of their respective companies.

Circle 170 on reader service card

Laura J. Kirk

Reisterstown, Maryland

TECHNICAL WRITER

WORDPERFECT FOR MACINTOSH USER

So why did you switch? Send an E-mail to stories@wordperfect.com or fax to 1-801-222-7176. We may use you in an ad. (Hey, it worked for Laura...) *$99 price is for customers upgrading from any word processor to WordPerfect 3.1.

©1995 Novell, Inc. Novell and WordPerfect are registered trademarks of Novell, Inc. Microsoft is a registered trademark of Microsoft Corporation. Macintosh is a registered trademark, and Power Macintosh is a trademark of Apple Computer, Inc.

Used to wear a mood ring.

Used to drive a Comet.

Used to use Microsoft Word.

Talk about embarrassing. "I can't believe I used to use it," says Laura Kirk about her past with Microsoft Word. Now she uses WordPerfect® for the Macintosh. "I use complex formats ... lots of graphics, color, indexing, etc. Not your basic interoffice memo level of work. So I need the native PowerMac speed and System 7.5 drag-and-drop support in WordPerfect. Besides, when I finally saw how bloated and Windows-like MS Word 6.0 is ... let's just say I'm glad I switched."

$99 upgrade offer.* Visit your reseller or call (800) 526-7820.

WordPerfect®

NOVELL.

Reviews

Vision 3d 4.0

3-D Modeler and Renderer

PROS: Excellent 3-D modeling tools; high-quality rendering capabilities; first-rate documentation. **CONS:** Only one level of Undo; truncated animation environment. **COMPANY:** Strata (801/628-5218). **LIST PRICE:** $695.

MW ★★★★

ROB MAGIERA

ALTHOUGH THROUGH THE years Strata's Vision 3d has been a highly regarded 3-D modeling, rendering, and animation package, recently it has been largely overshadowed by the company's Studio Pro. These days, Studio Pro is usually touted as the professional-strength tool, and Vision 3d is cast as an entry- to midlevel program. That's a bit of a shame, because Vision 3d is better now than at any time in its history. Over the past five years, Vision 3d has continually adapted and evolved, and the package you see today is a well-conceived, smartly executed, and modern-looking program with advanced modeling features and excellent rendering options.

With version 4.0, Vision 3d expands its array of modeling tools, adding the ability to perform Boolean functions, sweep surfaces, and skin and unskin objects. And it adds two new renderers—RenderScript, which lets you scale images to any size, and Phong with Shadows—to the program's already extensive rendering options. Sure, Vision 3d's animation capabilities aren't as sophisticated as those of Studio Pro, but for modeling and rendering, 3d offers a similar work environment and a comparable features list at half the price.

Visionary Architecture

Vision 3d derives its modeling and rendering prowess from plug-in program extensions. For developers, plug-ins are an easy way to add functionality; for users they provide a practical way to customize a program, letting you add or remove tools and features from the mix. Vision 3d's shape-creation tools, object editors, surface textures, and clip-object shapes are all extensions. Modeling plug-ins are either deployed on a button bar above the working area, found as menu selections, or both. Surface textures and shapes appear automatically in the Texture/Shapes palette.

In addition to a full complement of editable three-dimensional primitives (sphere, cylinder, cone, and so on), Vision 3d's modeling tools include the 2d Sculpter extension, which lets you precisely adjust Bézier-curved outlines that you can then lathe, extrude, and sweep into 3-D objects. In turn, you can reshape 3-D objects in the program's 3d Sculpter extension. The 3d Sculpter works with both polygonal and Bézier objects, letting you edit them by manipulating individual vertices or by deforming surface patches, a technique similar to shaping soft-clay models.

Vision 3d's new Boolean modeling extension allows you to perform union, subtraction, and intersection operations on objects. Vision 3d is a surface modeler, so the program performs these functions by calculating the interaction of the object surfaces. For example, union melds one object with another and removes their intersecting surfaces, while subtraction produces a gouge on one object from the intersecting surfaces of the other.

To perform Boolean operations you first move the objects into intersecting positions in the three-dimensional scene and then activate the Boolean modeler—a dialog box with a pair of scrolling lists—where you must find and select the objects you want to modify. The Boolean dialog

box lists every object in the current scene, but when you select an object, a wireframe thumbnail appears so that you can make a more-positive identification. Choose a Boolean function, and click on OK, and the modified object appears in the 3-D space.

Boolean capability is a great addition to Vision 3d, but unfortunately, the implementation isn't the best. Scrolling through lists to find the correct objects is cumbersome, and it can be confusing when the 3-D space contains several items identically named "cylinder" or "sphere." It would be easier on the user if the objects selected in the 3-D scene appeared automatically in the Boolean modeler, as they do in the 3d Sculpter. Furthermore, an implementation similar to the 3d Sculpter's would allow you to move around the object, see the effects of the Boolean operation, and make necessary adjustments before returning the object to the 3-D scene. As it stands, if you need to alter object positioning, you must undo the Boolean immediately upon returning to the 3-D scene. If you change viewpoints to assess the object's geometry, you can no longer undo the Boolean—you must start over.

True, the majority of Vision 3d's modeling extensions behave similarly; the program overall could use a few more levels of Undo. But modelers such as Lathe, Extrude, Skin, and Sweep perform object-construction operations that are generally easier to judge at first glance. On the other hand, Booleans are often object-editing operations, which tend to require more fine-tuning. All that said, I should in fairness note that Vision 3d's Boolean functions, like all its modeling extensions, work just fine.

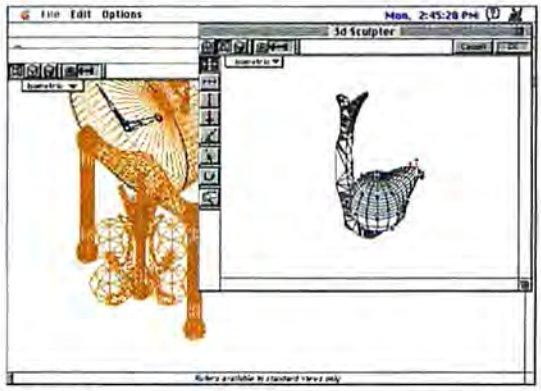
Visionary Images

Even when it was not as competent a modeler as it is today, Vision 3d was always an excellent rendering program. In addition to such standard renderers as Gouraud, Phong, and ray tracing, Vision 3d offers three unusual imaging options—RayPainting, Phong with Shadows, and RenderScript.

The RayPainting feature works like ray tracing, but rather than producing photo-realistic images, it emulates natural-media effects such as dry-brush and watercolor. In addition, RayPainting comes with two preset choices that reproduce the painting techniques of Vincent van Gogh and Georges Seurat.

New to version 4.0 is Phong with Shadows, a separate renderer that offers all the capabilities of Vision's regular Phong engine and adds the ability to create shadows. Also new is RenderScript, a Phong-based renderer that produces images in the EPS (encapsulated PostScript) file format. RenderScript can produce such photo-realistic effects as surface mapping and glowing surfaces, and since the output file is in PostScript, its images can be scaled to any size.

Practical Vision Vision 3d presents a straightforward environment that is simple to learn and use. Modeling tools, surface textures, lighting, and object shapes are all within easy reach.



Object Editing The 3d Sculpter extension lets you edit object surfaces by pushing and pulling on their vertices.

Vision 3d comes with dozens of surface and procedural textures to give objects the look of materials such as stone, wood, and glass. Surface textures are image maps applied to the outside of an object, while procedural textures are mathematical descriptions of texture materials that are applied to the entire object. Vision 3d provides excellent controls for customizing texture attributes, such as diffusion, specularity, transparency, and bump mapping.

Sadly, the Goodies CD that used to ship with Vision 3d is gone. It was filled with additional sample textures and shapes you could use right away. Vision 3d now comes with a locked CD containing complete shape and texture libraries; to unlock the libraries, you call Strata and get the key over the phone (you will need a credit card). But whereas the samples in the Goodies disc whetted the appetite, the library CD suppresses desire. Its browser provides such tiny thumbnails, you can barely see what you're buying.

Vision 3d 4.0 offers a competent, if somewhat limited, animation environment that lets you move objects along spline paths and animate textures to create surface transformations. In addition, the program comes with animation extensions that produce bouncing effects, convert 2-D lines to animation paths, and keep cameras pointing at moving objects.

In practice, the animation tools look and feel much like the ones in Studio Pro, but they lack the power, capacity, and flexibility of Vision 3d's high-end relative. Nowhere is that more evident than in Vision 3d's truncated animation palette, which is capable of holding only one object or group at a time. Although Vision 3d is more than adequate for creating simple motion effects such as flying logos, it is not equipped to tackle complex animations.

Visionary Docs

For the most part, 3-D programs are complex constructions that demand time and effort to learn and master. Packed with tools and features, Vision 3d is no exception. However, the program's excellent documentation makes the learning process relatively painless. Don't be put off by the two hefty manuals—one for modeling, the other for rendering and animation. With tutorials interspersing fairly comprehensive reference material, these manuals are easy to read, informative, and generally well organized.

If you just can't wait to get going, a separate tutorial volume provides a brief but thorough introduction to all facets of the program. Vision 3d runs on both 680X0 and Power Macintoshes and requires a minimum of 8MB of RAM. (I recommend a Power Mac with as much RAM as you can afford.)

The Last Word

With years of fine-tuning behind it, Strata's Vision 3d has matured into a wonderful modeling and rendering package. As long as your animation requirements are modest, Vision 3d is suitable for professional use in applications ranging from graphic arts to industrial design.

—CARLOS DOMINGO MARTINEZ

HP LaserJet 5MP

Personal Printer

PROS: Excellent gray-scale printing; 600-dpi resolution; takes less than 15 minutes to install on both Macintosh and Windows; can print large files with the standard 3MB of RAM. **CONS:** Prints only 6 pages per minute. **COMPANY:** Hewlett-Packard (800/752-0900). **LIST PRICE:** $1299.

MW ★★★★

FOR JUST $1299, THE HEWLETT-PACKard LaserJet 5MP laser printer meets the high demands of small businesses and home offices with robust features such as 600-dpi resolution, support for Adobe PostScript Level 2, and automatic-input switching between DOS/Windows machines and Macintosh networks—features that have become standard in this class of printer since the introduction of the Apple LaserWriter Select 360.

Additionally, the 5MP includes Adobe Memory Booster, software that makes better use of the printer's 3MB of available RAM, and an infrared (IrDA) port for the growing base of compatible portable and hand-held computers. Although the 5MP doesn't have built-in EtherTalk or built-in fax, both are available as options.

Six Pages per Minute

The printer's major drawback is that it prints only 6 pages per minute—an improvement over the LaserJet 4MP's 4 ppm, but slow when compared with the Select 360's 10 ppm.

For most tasks in Macworld Lab's standard test suite, including business documents with a variety of fonts and formats, we found that printing on the 5MP took approximately 40 percent more time than on the Select 360. For instance, when printing a 20-page Courier document from Word 6.0.1 at 600 dpi, the Select 360 took 139 seconds, while the LaserJet 5MP took 221 seconds—a difference of 82 seconds. Still, except for serious procrastinators, the slower speed doesn't always mean much in terms of lost time. People who use background printing will find the delay insignificant.

Quality Worth the Wait

And the wait will give you time to think about the excellent quality of each page. Hewlett-Packard uses Resolution Enhancement Technology to provide crisp text and line graphics, even with light weights and very fine lines. The printer is capable of 120 shades of gray, providing close to newspaper-quality gray scales. While the photos I printed were not fit for annual reports, they are more than adequate for paper presentations and internal company reports. Illustrations look great: lines and tints stand out well—even without using one of the higher toner-density options that Hewlett-Packard's LaserJet Utility provides.

ROBERT PERRY

The 5MP performed admirably with large images as well. In just 3MB of RAM, I was able to send a 288-dpi, 7-by-10-inch Photoshop file to the 5MP without an error. The 5MP's PostScript SIMM includes Adobe's Memory Booster technology, letting the printer compress resources such as fonts in the available memory. The 5MP has two additional standard 72-pin, 32-bit SIMM slots that accept up to 16MB each (for a total of 35MB). With less than 7MB of memory, the LaserJet 5MP rasterizes a page in strips to conserve memory; above 7MB each page must fit into memory—a potential problem with extremely large and complex files.

Setup with Ease

Installing the 5MP is incredibly easy. I was up and running on both a Power Mac 7100 and a Pentium 90 with Windows in under 15 minutes—total. Connections, both parallel and LocalTalk, are hidden by a plastic side panel. Like other Canon-based printers, the 5MP uses an all-in-one microfine toner cartridge that includes the photosensitive drum.

The 5MP includes Mac and Windows software, as well as QuickDraw GX drivers. A utility lets you manage fonts; print density; printer name and password; and EconoMode, which uses half as much toner per print. You can set resolution (300 or 600 dpi), Resolution Enhancement level, and printer-tray priority from the utility or the Print dialog box.

The LaserJet 5MP's two paper trays handle a variety of media and sizes. The first tray is a foldout multipurpose tray for letterhead, envelopes, labels, card stock, or transparencies. Paper sizes can range from 3 by 5 inches to legal size. A second paper tray, which slides under the printer as a drawer, holds up to 250 sheets of plain laser paper from standard letter size to A4 size to legal. A foldout output tray on the rear of the printer straightens the paper path so that paper doesn't curl. And there's a second output tray on top. When you print from the paper drawer to the top output tray, the paper path curls tightly around two rollers, which limits the range of paper you can use (16 pounds to 22 pounds).

I'd like to see future printers offer built-in PostScript fax and hard drive support for fonts. HP provides optional Ethernet and EtherTalk compatibility through its JetDirect EX printer server for $399 and optional fax capabilities with its PrinterPal Group 3 fax for $239.

The Last Word

The LaserJet 5MP exceeds the quality and versatility that most home-office and small-business users actually need. Granted, the 5MP is not as fast as its chief competitor, the Select 360, but for nearly identical features the 5MP costs about $200 less on the street. Price-sensitive people will be very happy with the LaserJet 5MP.—TIM WARNER

MW LAB How Fast Is the HP LaserJet 5MP?

Times are in seconds. Shorter bars are better.

	Multiple Fonts: Print speed for a 7-page Microsoft Word 6.0.1 file with a variety of fonts, sizes, and styles.	Single Font: Print speed for a 20-page Word 6.0.1 document with Courier text in plain, bold, and italic.	MacDraw Pro: Print speed for a complex drawing with special effects, simple objects, and text.	FreeHand 4.0: Print speed for a graphic with PostScript effects, nonlinear blends, and Bézier curves.	PageMaker 5.0: Print speed for a 4-page newsletter with several fonts, plus PICT and TIFF images.	TrueType: Print speed for a 1-page Word 6.0.1 document containing 4 TrueType fonts.
Apple LaserWriter Select 360	76	139	89	93	93	54
HP LaserJet 5MP	179	221	113	135	122	69

Zip Drive

Storage

PROS: Near hard-drive speed; reliable performance; beautiful packaging; easy setup.
CONS: Limited SCSI ID setup options; no on/off switch; not compatible with existing removable drives. **COMPANY:** Iomega (801/778-1000). **COMPANY'S ESTIMATED PRICE:** $199.95; 100MB cartridge $19.95.

MW ★★★★

FEW PRODUCT ANNOUNCEMENTS have generated as much anticipation from users as the one for the Iomega Zip drive. Imagine a 1-pound external drive, offering near hard-drive speeds, with a street price of about $200. Now imagine that it uses floppy-disk–size media, with 100MB capacity, that cost less than $20 per disk. (Both prices put this product at a much lower price per megabyte than a typical SyQuest drive.) It seems almost like a dream come true—and, with Iomega's new Zip drive, this is a dream that's largely realized.

The drive itself is dark blue, with an attractive, high-tech look. A plastic window at the top lets you see the cartridge inside, and there are decorative ridges toward the rear of the drive, on both top and bottom. You'll find nicely designed indentations in the right side for the power-supply cord, and at the front for easy cartridge insertion. Rubber feet on the bottom of the drive add stability in horizontal orientation; additional feet on the right-hand side allow for somewhat shaky vertical operation. The entire mechanism weighs about 1 pound and is 1½ inches high, a little over 5 inches wide, and a bit over 7 inches long. With the drive, Iomega supplies a 100MB cartridge called Zip Tools, containing all the bundled software.

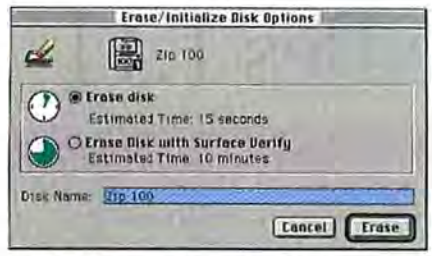
A paper manual provides very basic, but clearly illustrated instructions (an electronic manual, included on the Zip Tools cartridge, gives more details). The SCSI version of the Zip drive can be installed on either a Macintosh or a PC; floppy-based installer disks and instructions are provided for both of those platforms. Once you use the Zip Tools cartridge on one platform, though, it no longer works with the other platform. This means that if you want to install the PC software after you've used the Macintosh software, you have to buy another copy of the Zip Tools cartridge (at $39.95 from Iomega).

The rear of the drive has two 25-pin SCSI jacks (as opposed to the 50-pin jacks you find on most other hard drives and removable devices), a terminator switch, and a SCSI ID switch (which lets you select ID 5 or ID 6). The lack of the full set of SCSI ID numbers is a minor problem; users with a complicated SCSI chain may be forced to switch ID numbers around to add a Zip drive. There's no on/off switch; the mechanism reverts to sleep or idle mode, however, after 15 minutes of nonuse.

In addition to Iomega's own disk-mounting and -formatting software, Zip Tools also contains a no-frills backup utility, Personal Backup, from Highwire, which is capable of doing simple, scheduled backups; demonstration versions of DiskDup Pro and Virtual Disk (which is my favorite disk-cataloging utility) from Continuum Software; and two demos of games, Bungie Software's Marathon and Pathways.

The disks look much like regular floppy disks with a weight problem. Each disk is about twice as thick as a regular floppy but offers much greater performance and capacity. Although I didn't do formal benchmarks, I was easily able to get file-transfer rates of from 1000K to 1200K per second (with the Zip drive attached to a PowerBook 540c), which is better performance than most small hard drives offer. Access times are slower than those of a regular hard drive, so the Zip cartridge takes somewhat longer to copy lots of small files (but the difference isn't dramatic). You can initialize your cartridges with the Zip Tools program, or with the Erase command in the Finder, in less than 10 seconds. Formatting a cartridge (with full verification of the disk media) takes about 10 minutes. Formatted capacity of the 100MB cartridge is about 94MB.

As with other removable drives, Iomega uses a system extension to allow cartridges to mount on your Macintosh's desktop after start-up. For easy portability and installation on other Macintosh systems, Iomega supplies a Guest application that loads the Zip device driver into RAM and lets you mount disks without having to install any drives, control panels, or extensions in anyone else's System Folder. When you insert a cartridge, it appears on a Mac's desktop in less than five seconds.



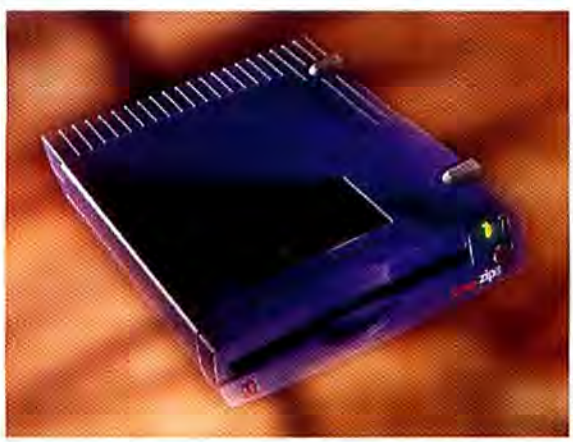
Zipping through Formatting Options You can initialize a Zip cartridge with the Finder's Erase Disk command, or you can do a full surface format with this program.

The Zip drive is an absolute joy to use. Its performance is as flawless as one can desire. The mechanism is nearly silent in operation, except for a slight clicking noise when you insert or dismount cartridges. The cartridges themselves seem robust, and they withstood days of continuous use for file transfers, backups, and reformatting without suffering any ill effects. The media gets a lifetime warranty from Iomega. (The only problem I've heard about was a buggy set of Zip Tools cartridges in the initial shipments of the drive, but these were replaced early on by the company.)

The Last Word

Iomega's Zip drive combines speedy performance, convenience, and economy in an attractive package. There's little to criticize and much to praise in this product. Early reports are that many dealers are back-ordered because the demand has been so great. But before you buy, consider whether an existing removable format, such as Bernoulli, optical, or SyQuest, would provide better compatibility if you need to send cartridges to a service bureau or exchange them with other users. Still—and despite the fact that it's a new format—if Iomega can get the media price down, it may have found a replacement for the floppy drive. This is one product I'd buy myself, and that's a lot for an old, jaded reviewer to admit.

—GENE STEINBERG



TOM GIBSON

xRes 1.11

Image Editor

PROS: Faster than Photoshop; numerical filters; multiple undos; can control the number of brushstrokes to undo; good CMYK and masking functions; requires less RAM than Live Picture. **CONS:** Slower than Live Picture; can't perform operations in background; no image previews inside Open dialog box; can't undo cropping or deletions; bewildering text tool; interface irregularities. **COMPANY:** Fauve Software (415/543-7178). **LIST PRICE:** $799.

MW ★★

FAUVE SOFTWARE'S XRES is a cross between HSC Software's Live Picture and Adobe Photoshop—but slightly less expensive and less reliable. Like Live Picture, xRes speeds up image editing by applying edits and effects to just the visible portion of the composition. When you complete the project, you can render the final composition to a separate image. Like Photoshop, xRes lets you paint and edit the contents of layers directly (as opposed to having to create additional cloning and effects layers, à la Live Picture). And, like Fractal Design Painter, xRes has natural-media brushes and paper textures.

Resolution Technology

Both xRes and Live Picture are designed for creating large compositions full of high-resolution images. You start out by converting an image to a proprietary format—LRG in xRes, IVUE for Live Picture—that stores an image several times, in progressively smaller resolutions. (You don't have to convert an xRes image to the LRG format, but the program's performance suffers if you don't.) As you edit, the software grabs chunks of the image and uses them as full-screen proxies to display the results. The programs store edits in a separate composition file—XRS for xRes, FITS for Live Picture—thus preventing permanent damage to the original image. Finally, after you've edited the composition, you can render it out to a separate image file.

But beyond these similarities, xRes and Live Picture go their separate ways. For example, Live Picture's brushstrokes are independent mathematical objects, with no inherent resolution. By contrast, when you paint or clone in xRes, the brushstroke has the same resolution as the image on which you paint. The brushstroke even adopts the resolution of the base image on a new layer. This makes cloning in xRes more flexible, but makes rendering the final image less flexible.

Both xRes and Live Picture are faster than Photoshop at opening optimized files and applying brushstrokes. But Live Picture outpaces xRes in other common operations. For example, on my Power Mac 7100/66 with a 21-inch monitor, a typical transformation took 5 to 10 seconds in xRes versus less than a second in Live Picture. (I used a 52MB file, but file size has almost no bearing on performance.) xRes applies filters more slowly, but it offers precise numerical options, while Live Picture limits you to vague brush-on effects. Zooming and scrolling are nearly instantaneous in both programs. However, Live Picture redraws the new screen pixels automatically; in xRes you manually initiate the redraw, which can take as long as 30 seconds, during which time you can't switch apps.

Good Ideas Gone South

To its credit, xRes supports more file formats than Live Picture. But while it can open PICT files, for example, xRes is incapable of decoding QuickTime JPEG compression, nor can it preview images inside the Open dialog box. The program also opens Photo CD files but doesn't dim the option for 496-by-644-pixel Pro Photo CD resolution when perusing a list of standard Photo CD scans. If you try to open a regular Photo CD image at Pro resolution, xRes delivers a series of empty alert boxes. You can plod through these invisible error messages by pressing the return key 10 or 20 times, but your reward is a 72MB window full of black.

Text Trouble The Text Tool dialog box initially highlights the Size option box, even though the main text-entry box is active. If you select a Style check box, xRes mysteriously activates the Size option box.

A theoretical advantage xRes has over Live Picture is multiple undos. On the plus side, xRes can undo up to ten operations per layer, and you can change the number of undos without quitting the program. You have complete control over undo intervals, so you can make a series of brushstrokes equal to one undoable operation. There's also an undo eraser for making partial reversions. But you cannot countermand the movement or transformation of a layer, the cropping of a composition, or the deletion of an image. To make matters more confusing, the Undo command never lists the operation it's prepared to rescind. And, guess what—there's no Revert command.

Version 1.11's text tool lets you enter text into a dialog box much like the one in Photoshop. But the dialog box presents you with conflicting signals. For example, when the dialog box first opens, the contents of one option box are highlighted, while an insertion marker blinks in another. Characters entered from the keyboard appear in the latter option box, even though the former continues to be highlighted. Meanwhile, you have no control over leading or letterspacing, and the program doesn't automatically kern. However, xRes does redraw text at a higher resolution after you enlarge it.

The Last Word

xRes includes a wealth of prepress-quality CMYK-conversion controls. (Note, however, that as with Live Picture, you can't print from the program.) Its solid masking functions and brush modifiers go beyond what you find in Photoshop. It includes a host of useful filters, though the previewing functions need fleshing out. It supports Photoshop-compatible scanner-acquire modules, it supplies lots of customizable (though quirky) gradient options, and it runs in only 16MB of RAM, all advantages over Live Picture.

But sadly, the program's oddities are enough to give the most patient user pause. Cursors don't always correspond to the current action and can even carry over into other programs. You can't simply drag a selection to move it; you have to first float it onto its own layer. When transforming a layer, you have to position a tiny cross on the cursor exactly over a corner handle or xRes ignores you. The image window lacks a zoom box, so you can't snap the window to the visible image size. You can't delete a layer by simply pressing the delete key; you have to choose a command and endure an alert message. If fate deals you an 8-bit monitor for a day or two, you'll find that xRes can neither dither nor optimize the color lookup table. For a program geared specifically toward imaging professionals, xRes is unacceptably slipshod, despite its potential.—DEKE McCLELLAND

Pictura 310

Color Printer

PROS: Inexpensive. **CONS:** Mediocre color-matching scheme. **COMPANY:** Fargo Electronics (612/941-9470). **LIST PRICE:** $4995; optional Adobe PostScript Level 2 Software Package $795.

MW ★★★

AT A STREET PRICE OF AROUND $4000, the Fargo Pictura 310 is the most affordable tabloid-size dye-sublimation printer available today. Priced well below its competitors, the Pictura supports both thermal-wax printing and photo-quality dye-sub output. Despite minor problems and a dearth of color-matching abilities, this printer may win cost-conscious customers away from its much more expensive competitors.

Like the Radius ProofPositive and the 3M Rainbow, the Pictura 310 supports full-bleed tabloid-size printing and prints up to 12-by-18-inch documents. It also supports a wide range of paper sizes, as well as other print media like transparency film and T-shirt transfers.

CPU-Based Printing

The Pictura 310 uses a parallel interface, instead of the SCSI connections of the ProofPositive and 3M Rainbow, and it uses the host CPU for rasterization. Therefore, the faster your Mac, the faster the rasterizing. Background printing taxes your computer by using CPU cycles, RAM, and hard disk space, however. The minimum system requirements are 8MB of RAM and 20MB of hard disk space; Fargo recommends 32MB of RAM and a hard drive with 150MB available.

There are two drivers available for the Pictura: the QuickDraw-based RasterSoft driver, which comes with the printer, and the PostScript-based CPSI (Configurable PostScript Interpreter) driver, a $795 software option developed by Adobe for Fargo that adds genuine PostScript Level 2 capability to the printer—a necessity for users of Adobe Illustrator, Macromedia FreeHand, and QuarkXPress. CPSI also allows users to share the Pictura 310 on a network. Neither driver is Power Mac native.

Fargo should consider adding an Adobe Photoshop export module. Based on my experience with other printers, a Photoshop export driver offers at least a twofold speed increase over the regular PostScript driver.

The Pictura 310 could achieve neither the promised 2 minutes per page for thermal wax nor 10 minutes per page in dye-sublimation mode. Expect to wait at least 5 minutes per page for a thermal-wax print and more than 15 minutes per page for a dye-sublimation printout of decent size and complexity.

Acceptable Print Quality

Like most of its competitors, the Pictura 310 generates nice continuous-tone photo-realistic quality in dye-sublimation mode. The printouts showed a slight shift in color and were more saturated than I would like. The thermal-wax printouts, while not as crisp as the output from some other low-end thermal-wax printers, were truer to the original images' colors than the dye-sublimation printouts were. The quality of text output was mediocre compared with that of the ProofPositive and the 3M Rainbow. While the QuickDraw driver supports antialiasing options for text, the CPSI driver doesn't.

Best of Both Worlds?

Having both dye-sublimation and thermal-wax technology in one printer is useful. For preliminary designs, you can print in thermal mode, switching to dye sublimation for final prints, and thus save a lot of money in consumables.

To switch between thermal-wax and dye-sublimation modes, you need to change the ribbon type and the paper (the Pictura uses different ribbons for different modes), and then select the correct settings in the driver's page-setup dialog box—a process that could be simplified. For users who constantly switch between dye sub and thermal wax, the $249.95 optional paper tray is worth considering.

I also noticed that tiny specks of ink had chipped off of the first few prints. This problem usually happens after switching from one ribbon type to another, but after several prints in the new mode, the problem disappears.

RICHARD RETHMEYER

Poor Color Matching

Advertised as a printer for proofs, comps, and prepress work, the Pictura 310 will have to overcome a big obstacle—color matching—to compete with the ProofPositive or the 3M Rainbow, both of which come with excellent color-matching software. The Pictura 310, on the other hand, has a couple of proprietary color-management schemes and supports basic Apple ColorSync, but nothing proved effective. I had no luck at all getting the dye-sublimation output to match a commercially produced MatchPrint. Also, I had problems color-matching thermal printouts to dye-sub prints. This makes it impractical to correct color in thermal mode before printing the final in dye-sublimation mode. According to Fargo, Agfa and Kodak are working on aftermarket profiles that should be available at a reasonable cost by the time you read this. Still, Fargo should bundle at least one of the profiles with the printer.

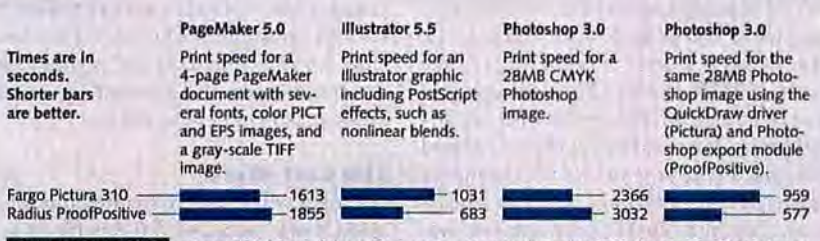
I encountered a couple of glitches while using the Pictura. For example, although the printer was running, I ran into occasional printer-not-ready messages (usually fixed with a printer restart).

The Last Word

As of now, if you can live with its shortcomings, the Fargo Pictura 310—coupled with the CPSI driver from Adobe—represents a good value in a tabloid-size dye-sub/thermal-wax printer. To take full advantage of it, you should invest in a color-management package.

—MARK HURLOW

MW LAB How Fast Is the Pictura 310?



BEHIND OUR TESTS Macworld Lab tested the printers using a Macintosh Centris 650 with 40MB of RAM and an external 1GB hard drive. We used the CPSI (Configurable PostScript Interpreter) driver for all tests except one Photoshop test, as noted.

Symantec C++ 8.0

C++ Compiler for Power Macintosh

PROS: Great class browser; very nice editor; Visual Architect speeds interface design; project manager eases development bookkeeping. **CONS:** Minor glitches; some support gripes; demands lots of resources. **COMPANY:** Symantec (503/334-6054). **LIST PRICE:** $499.

MW ★★★

SYMANTEC'S THINK C AND Think Pascal are the most popular Mac compilers of all time. At the time the Power Mac was being designed, Think C and the Think Class Libraries were probably the modern environment most used for small and medium-size development projects, with Apple's Macintosh Programmer's Workshop (MPW) being reserved for bigger, large-team commercial projects.

Therefore, it was a major disappointment for thousands of programmers that Symantec took so long to get a native Power Mac version of its C++ development system out the door. But the whole native Power Mac development system is here now, after almost two years of Symantec's efforts with TRex, Crossbow, and safari hats.

Everything and More

Symantec C++ 8.0 (SC++ 8.0) is a complete professional development environment with native, optimizing PowerPC compilers for C++ and ANSI C. This new version includes a project manager that's better suited to large-scale program development than is the already quite competent project manager in earlier Symantec and Think packages. Since the project manager supports AppleScript and nested projects, it's possible to design all sorts of automated project-management routines and have the project manager build 680X0 or Power Mac applications. The SC++ 8.0 editor supports multiple fonts, colors, and styles, as well as automatic formatting, scripting, and split panes. I think it's as good as or better than any stand-alone programmer's editor on the market.

Visual Architect is not, as the name suggests, a visual programming tool like ProGraph, but it is a valuable tool for quickly developing attractive interface elements, and it's a unique feature of the Symantec environment. This version of the class browser has clearly been influenced (in terms of features) by the ongoing example of ACI US's brilliant Object Master (see "Go Ahead, Browse"). The original Think Class Library, a traditional favorite, has been updated for 680X0 and Power Mac support. The Symantec debugger goes far beyond those offered in the Metrowerks or MPW Power Mac compilers, with very nice multiwindow displays (including stack view and data view). Professionals will probably still prefer Jasik Designs' The Debugger, but Symantec's is certainly an impressive "free" debugger.

Symantec, belatedly recognizing some responsibility to rescue stranded Think Pascal users, has announced an agreement with Language Systems to make LS Pascal an add-in. In fact, the development environment has been designed to accommodate any kind of third-party compiler, so the millions of lines of FORTRAN code that still constitute much science and engineering software may find their way to the Power Mac through this Symantec backdoor.

Go Ahead, Browse The highly evolved class browser in Symantec C++ 8.0, used with the integrated Think Reference, makes this colossally complex product accessible even to beginning programmers.

Fat City

Of course, the product as delivered on CD-ROM will produce, in old Think product hands or 6.0 buffs, a shock like that of meeting an old college pal who has gained 120 pounds since you last saw him. SC++ 8.0 and its related files take about 250MB on the CD, although you have a choice of Power Macintosh installations that need about 40MB of hard disk space (the rest of the CD contains alternative installations, goodies, third-party files, the 680X0 development systems, and documentation).

Hard disk space isn't the size problem, however. Symantec claims that you can do Power Mac development on a Power Mac with a mere 16MB of RAM. This claim needs to be modified. You can use SC++ 8.0 with 16MB of RAM for most real programs only if you use virtual memory, which slows building and compiling to a crawl. From a little statistics program (80K of source code, originally written in Think C 6.0), SC++ 8.0 can generate a compiled application in 9 seconds on a 7100/66 with 24MB of RAM (virtual memory off); the comparative time on a 6100/60 with 16MB of RAM (virtual memory on) is 7 minutes! Symantec is working on this problem, but if you're serious about using this product on big projects, you may as well order more RAM.

You can optimize the compiled code for speed or for minimal application size, but not both. Compiled code quality is very good—I produced smaller and faster Power Mac apps from my source test suite with SC++ 8.0 than with Metrowerks CodeWarrior 5.0, although a new version of CodeWarrior should be available for further comparison in summer 1995.

Facing Off

Most potential Power Mac programmers will have to make the basic choice: Metrowerks CodeWarrior 5.0 or Symantec C++ 8.0? CodeWarrior has the advantages of simplicity, compactness, and a reputation for excellent support. Symantec's product is a more polished development environment and has the advantage with its editor, class browser, and compiled code. Its support reputation, however, is something the company is currently working to overcome. But if you have been using Symantec products all along, SC++ 8.0 can make you a first-rate Power Mac developer with only trivial installation effort, which is likely to tip your decision balance to Symantec.

Although you cannot simply set a Symantec switch and recompile for Windows, the company does offer a highly compatible compiler environment for C++ programmers who are on the other side of the fence. This product was designed from the ground up to ease cross-platform development.

The Last Word

It took a while, but Symantec did lots of good work on SC++ 8.0 during its long incubation. It offers a feature-rich, friendly environment and laudable compiled code quality.—CHARLES SEITER

Fujitsu ScanPartner Jr.

Desktop Scanner

PROS: Compact; one-button operation; built-in ten-sheet feeder; bundled with good OCR software. **CONS:** Can't handle rigid originals or documents wider than 8½ inches; OCR software saves only in black and white. **COMPANY:** Fujitsu Computer Products of America (408/432-6333). **LIST PRICE:** $499.

MW ★★★

FUJITSU'S BUNDLE OF THE SCANPARTner Jr. scanner and Xerox's TextBridge 2.0.4 makes converting hard-copy documents to editable text about as easy as making toast. For less than you'd pay to outfit a flatbed scanner with a sheet feeder and OCR software, you get the one-button convenience of a toaster in a device about the size of a loaf of bread. It's perfect for any office that's rife with letters, contracts, articles, or other hard-copy documents that need to be captured for editing, annotation, or layout.

Just drop up to ten letters, magazine pages, hard-copy faxes, or other documents into this compact page-grabber's feeder, and click on the Go button. The sheets slide smoothly through at 20- to 40-second intervals while the TextBridge software translates each page into WriteNow, WordPerfect, MacWrite, Microsoft Word Rich Text Format, or one of a clutch of MS-DOS word processor formats. For two-sided documents, just scan the odd-numbered pages first, then flip the stack and run the even-numbered pages through. TextBridge retains the correct order. (Note: while the ScanPartner Jr. can capture at 300 dpi in 256 gray tones, TextBridge saves its TIFF or PICT files in only black and white.)

The ScanPartner Jr. can't handle books and thick or inflexible sheets (which can't feed through the thin slot and make the required 90-degree turn), or anything wider than 8½ inches or much narrower than the 4-by-6-inch sheets recommended for use with the automatic document feeder. In my tests, thin, odd-size, wrinkled, or otherwise troublesome documents fed through manually, albeit with some difficulty. Pages torn from *Macworld*, for example, often slipped and skewed.

The ScanPartner Jr. fits anywhere you can find 12 by 4 inches of free space, and at 3½ pounds (plus about a pound for the power brick) it's small enough for portable use. TextBridge calls for 8MB of RAM, but it'll run with 4MB of real memory and another 4MB of virtual memory—with a performance penalty.

Don't be fooled by TextBridge's minimalist dialog box, which shrinks down to include only four decisions: File or Scanner input; Text or Image output, or both; and whether you want to use pop-up Preview and Verifier windows. This is a laudably accurate and powerful OCR program. (For a comprehensive review of TextBridge, see *Reviews*, *Macworld*, September 1994.)

You can set TextBridge to work with either portrait- or landscape-oriented documents, or you can have it auto-sense orientation, which takes a little longer. The software is smart enough to handle pages with, say, text in portrait orientation and landscape-orientated charts.

TextBridge's accuracy depends highly on the quality of the originals. In my tests, using a 30-page mixed bag of submissions for a newsletter, laser-printed, 300-dpi pages with 12-point type yielded only three or four recognition errors per page. TextBridge also did a fine job on some typewritten pages (eight to ten errors per 1000-character page); the only test that caused it to choke was a hard-copy fax of a 9-pin dot matrix original. It recognized so few characters that retyping the document would have been faster.

The Last Word

If you have a manila folder full of hard copy, but what you want is a Mac folder full of text files, the ScanPartner Jr. plus TextBridge offers an economical and fuss-free solution. Its focus on doing one job well means you don't get all the flexibility and capabilities of a flatbed scanner, but for small businesses, law offices, and individuals who work more with text than pictures, this bundle is a really good deal.

—DAVID D. BUSCH

TOM GIBSON

FileWave 2.1.2

Software-Distribution Tool

PROS: Remote updates occur during idle time; automatic file-transfer recovery; site-managed copy protection. **CONS:** No file-set creation tools. **COMPANY:** Wave Research (510/704-3900). **LIST PRICE:** $895.

MW ★★★★

BECKMAN'S LAW STATES THAT TIME spent maintaining software on a LAN increases as the square of the number of users. That's because more users mean a wider variety of software packages that need to be updated at increasingly frequent intervals. FileWave automates this process, letting you maintain a central repository of files and distribute them—and any future updates—unobtrusively to network users.

FileWave consists of three components: a program that runs on a server Mac and creates a central repository of files, an administration tool that runs on the administrator Mac, and a user extension for each target user's Mac.

FileWave is a complex product, but its drag-and-drop Finder interface mitigates its complexity somewhat. You carry out all tasks directly from the administrator Mac's desktop, starting with mounting the repository server as a shared volume just as you would any AppleShare volume.

Once mounted, FileWave's repository volume looks like any other shared volume, but it's actually a temporary partition of the server Mac's hard disk. It contains the files you want to distribute and two folders named Files and Users.

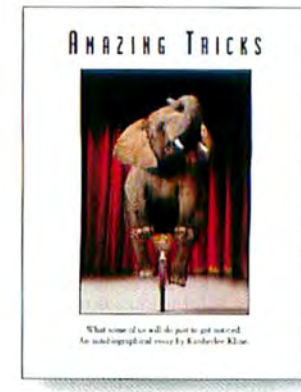
Distributing files with FileWave is a four-step process. First, you create subfolders (called file sets in the Files folder and user groups in the Users folder) that contain the applications you want to distribute and that represent the users to whom you're distributing.

Second, you tell FileWave where on each user's machine to store individual files in a file set. You do this by ⌘-dragging the files to special target folders. FileWave limits you to two general target locations: the user's System Folder (and its subfolders), and a temporary disk partition created by FileWave on each user's machine.

Third, you drag and drop the entire file set to destination user groups. And fourth, you select the Update Model item from FileWave's menu in the Finder.

continues

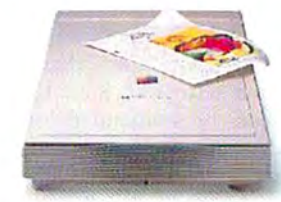
Tiny had the hard part. Scanning it was easy.



Introducing HP ScanJet Scanners

They're simple to set up. Even simpler to operate. And with software that makes scanning more automatic, using HP ScanJet scanners has never been easier. The new HP ScanJet 3c now offers internal 30-bit color at 2400-dpi enhanced resolution (600-dpi optical), and also includes free Corel PHOTO-PAINT for PCs.* The HP ScanJet 3p delivers 1200-dpi enhanced resolution (300-dpi optical). Both come with OCR software. For more information, call 1-800-SCANJET, Ext. 9232.†

Grayscale – $599



Color – $1,179

The easiest thing you'll do all day.

HEWLETT® PACKARD

*For Macs, free Adobe Photoshop LE.™ Suggested U.S. list prices. †In Canada, call 1-800-387-3867, Ext. 9335. ©1995 Hewlett-Packard Company PE12526

This kicks off the distribution process.

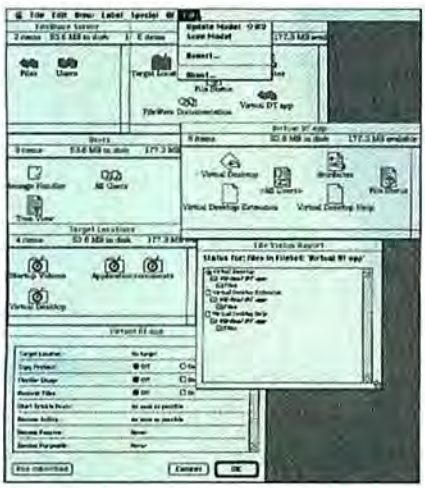
FileWave distributes files simultaneously to all users, moving data only when a user's machine is idle. This makes distribution completely transparent to users and puts no adverse load on the LAN. If a user shuts down in the middle of a transfer, FileWave picks up where it left off when the user restarts the Mac.

FileWave incorporates several features that add to its utility. You can specify copy protection for distributed files; this prevents users from copying or duplicating them. You can also tell FileWave to move replaced files to a recovery folder rather than delete them. To help monitor compliance with site licenses, you can view statistics on the number of concurrent users for a given package. You can track distribution and perform version control. And at any time you can have a user's application set rebuilt from the repository—a useful feature for recovering crashed machines.

Building the file sets proves to be FileWave's one major inconvenience. To distribute a package such as Microsoft Word, you must know where that application places all of its components. A tool that would compare volumes before and after performing a model installation and automatically build the distribution file set would be useful. The package includes a booklet outlining installation details for a handful of programs: it's an aid, but it's hardly comprehensive.

The Last Word

Were it not for the familiarity of its Finder-based user interface, FileWave's complexity would be a hindrance. But once you understand what to do, you'll remember it—and save untold hours distributing files.—MEL BECKMAN



Drag-and-Drop Action FileWave's Finder-based interface lets you load the FileWave repository, register users and groups, initiate distribution, and generate reports, all from the administrator's Mac.

CD-Q 2.0

Photo CD Plug-in Utility

PROS: Robust, on-the-fly color correction and separation from Photo CD YCC format.
CONS: Small previews; poor documentation.
COMPANY: Human Software Company (408/741-5101). **LIST PRICE:** $145.

MW ★★★

KODAK'S YCC FORMAT FOR PHOTO CD makes possible more than just digital photographs on a CD-ROM. It offers six levels of resolution (up to 4096 by 6144 pixels—enough to print a slide at 17 inches at a 175-line screen), plus excellent compression. And Photo CD processing is widely available to consumers. However, to use a YCC image file in printing or presentations, you must first convert it to a format that your applications can use.

CD-Q, an Adobe Photoshop plug-in, lets you set conversion and correction parameters, such as cropping or fine-tuning color separations, before opening your Photo CD files. It works with any image processor that supports Photoshop plug-ins.

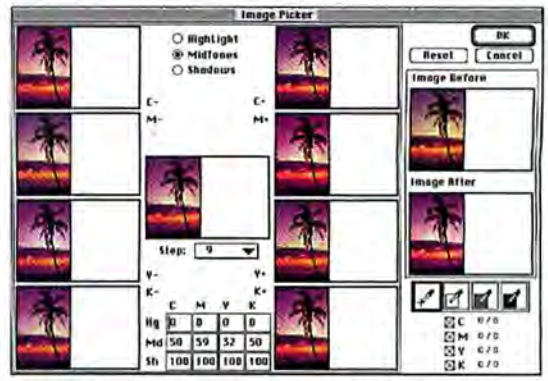
From CD-Q's main screen you choose one of three color models to open your YCC file: gray scale, RGB, or CMYK. You also choose a scheme for making color corrections—RGB, Gradation, or for the less experienced user a variations-style Image Picker. Tools that crop, rotate, mirror, and sharpen, plus controls for setting image resolution and for varying the generation and intensity of a black plate, are also in the main screen. An online densitometer in CMYK and RGB modes lets you sample colors and adjust highlights, midtones, and shadows in the composite image.

Correcting Colors

If the ultimate destination of your images is on-screen display, you choose the RGB mode from CD-Q's main screen. In RGB mode, slider bars let you control the red, green, and blue channels individually, as well as overall saturation and brightness. The RGB mode also offers nine predefined monitor profiles for adjusting your display, although no monitor types or color temperatures are given for the settings. If some of the colors fall outside the gamut, a clipping alarm shows which pixels are affected. (It would be more convenient if the monitor and gamut-alarm controls were on the main screen.)

If your Photo CD images are destined for four-color printing, you enter the Gradation area from CD-Q's main screen. Here, instead of the sliders in RGB mode, you adjust graphed Bézier curves for the cyan, magenta, yellow, and black channels. Unfortunately, the graphs are smaller than the equivalents found in Photoshop, making them harder to use. (Pressing the shift key while selecting the Gradation mode brings up a version with before-and-after thumbnail images—a strange option, since you can preview your corrections in either version.)

CD-Q's simplest way of correcting CMYK colors is to use the Image Picker, which presents thumbnail previews that show how additions or subtractions to any of the CMYK channels compare with the uncorrected image. You can also vary the colors in the HighLight, MidTones, or Shadows ranges separately. It's more intuitive, but the Image Picker's small thumbnails limit its usefulness. You can save any setting in CD-Q to files from any of the various modes for later recall.



Channel Surfing Thumbnail selections in CD-Q's Image Picker let you preview alterations to each CMYK channel.

A vignette feature lets you make the edges of your pictures fuzzy. (You can also blend between a portion of your image and any solid color.) You choose from eight predefined vignette shapes or create new shapes with a spray-can tool. Although this capability is handy, its interface is confusing and it could use a greater variety of brush shapes.

The Last Word

While Photoshop has equivalents of all these features, and implements them in a more straightforward manner, it does not access the YCC format as directly as does CD-Q. If you frequently use Photo CD for much of your image processing and don't mind an inelegant interface and perfunctory documentation, CD-Q can be a good addition to your image processing suite.—MATTHEW C. NIELSEN

With Select Phone, the fishin' is easy. Say you're a supplier, and you want to look up tackle shops. Key in "fishing" under business type, the area code or zip code for the area you're interested in, and – *gotcha* – there they are. So who do *you* want to find?

If you're fishing for new business, here's a fantastic place to cast. Select Phone, the extraordinary Phonebook on CD-ROM, gives you access to the white and yellow page directory listings of every city in the U.S. – *over 84 million residences and businesses.* That's a lot of bytes. And there's a lot of ways to haul in your catch: Search by name, street address, city, state, zip code, area code, phone number, even business heading or SIC code. Zero in on a particular listing. A long-lost friend. An obstetrician on Oak Street. Or cast your net a little wider. Tackle shops in Toledo. *Select Phone lets you search for anyone, anywhere, any way you want. You're in control.* Then, call the names you find, mail to them, or export them to your own word processor. It's like shooting fish in a barrel. For the names of software stores carrying Select Phone, call 1-800-99-CD-ROM. Online go to sales@procd.com or visit our world wide web site at http://www.procd.com.

FIND WHAT YOU'VE BEEN MISSING.

Circle 217 on reader service card

Need to look-up all the tackle shops in Toledo? This will reel 'em in.

Vista-S8

24-Bit Color Flatbed Scanner

PROS: Clear, crisp, high-quality line-art scans; decent reproduction of color and gray-scale artwork; fast artwork previews; easy setup. **CONS:** Somewhat slow OCR scanning; scanning software has bugs. **COMPANY:** Umax Technologies (510/651-8883). **LIST PRICE:** LE+ version $995; Pro+ version $1095.

MW ★★★

THE UMAX VISTA-S8 SCANNER HAS A lot of useful features for its low price. It's a single-pass, flatbed, 24-bit color scanner, offering 400-by-800-dpi optical resolution. It uses a technology called Ultra-View to provide an interpolated resolution of 6400 dpi (far greater than any printer would need). Umax includes its MagicMatch software for calibrating color between the scanner, monitor, and output devices; as well as VistaScan, for general-purpose scanning. VistaScan comes as a plug-in for Adobe Photoshop or as a separate application that can be used without running Photoshop.

The lower-cost version of the Umax scanner package, the LE+, includes Adobe Photoshop LE, Caere's OmniPage Direct software for optical character recognition, and a Corel Professional Photos CD-ROM. The Pro+ version includes the full version of Photoshop, HSC Software's Kai's Power Tools and Kai's Power Photos CD, Pixar Typestry, and Pixar 128.

Installing the Vista-S8 is easy. The rear panel includes a knob for locking and unlocking the optical components (locking protects them during shipping), a SCSI ID selector switch, SCSI jacks, and an on/off switch. An additional jack is provided for installing an optional transparency adapter or automatic document feeder; neither of these items was tested for this review.

The VistaScan plug-in includes a decent selection of image-adjustment tools. There's a reasonably accurate autodensity feature that sets the best highlight and shadow values for your artwork. In addition to allowing you to manually adjust for highlight and shadow, VistaScan offers settings for gamma, image size, and resolution; as well as filters for blurring and sharpening the image. A descreen option is also included. It removes the dot pattern from halftoned images.

The software works relatively well, but it does have a few problems. You can use a selection rectangle to manually crop the area to be scanned, but the bottom of the artwork tends to overscan slightly (extending 20 or 30 pixels beneath the rectangle). Also, the stand-alone version of VistaScan didn't work during my tests (using my Power Macintosh 8100/80, running System 7.5.1); I couldn't get it to acquire an image. I talked with several representatives of Umax technical support, but they were unable to offer a solution. Both versions of the scanner come with Photoshop, so the problems I encountered were merely inconvenient; using the plug-in was an effective solution. Still, it would be preferable if the stand-alone software worked.

ERIC HARGER

One of the Vista-S8's biggest advantages is speed—it takes seconds to preview just about any artwork you throw at this unit. Even final scans of 1200-dpi line art are acceptably quick. The image quality of color and gray-scale art was good, with decent rendition of midtones. In cases where the VistaScan software could not bring out the best image quality, Photoshop made up the difference. I did not attempt to see the quality of an interpolated 6400-dpi image—the resulting file's size would exceed that of most users' hard drives, and even the best imagesetters are incapable of reproducing anything of that resolution. But interpolated 1200-dpi line art looked just fine when reproduced on my 600-dpi laser printer. Optical character recognition was a tad on the slow side, taking about 50 seconds to interpret a letter-size page.

The Last Word

For less than a grand, the Umax Vista-S8 is a good value. If you can overlook the slow OCR, and the software problems, you'll find your money well spent on this scanner.—GENE STEINBERG

PhotoFlash 2.0

Image-Editing Utility

PROS: Well-integrated AppleScript support; good drag-and-drop cataloging features; includes scripts for automatically placing images in page layouts. **CONS:** Limited image-retouching tools; searching catalogs by sketch or similarity is rarely effective. **COMPANY:** Apple Computer (408/996-1010). **LIST PRICE:** $129.

MW ★★★

PHOTOFLASH IS APPLE'S OWN PHOTO-enhancement and -cataloging program. While it doesn't offer the image-editing power of Adobe Photoshop, it does provide the basic tools you need to enhance, resize, and retouch images acquired from a scanner or digital camera and then organize those images for placement in desktop publishing programs. With the release of version 2.0, Apple has vastly improved the program's cataloging features, added support for the Apple QuickTake 100 digital camera, and cut the price in half.

PhotoFlash handles images saved in PICT, TIFF, JPEG, Photo CD, EPS, and DCS file formats. (It can also read native Photoshop files but can't save files in that format.) You can easily convert files from one type to another, employing any of several file-compression options.

The program's image-enhancement tools cover the basics: brightness, contrast, overall exposure, and color balance. But PhotoFlash doesn't include tools for editing individual color channels, creating masks, or applying sophisticated special effects. (The program does support many of Photoshop's plug-in filters, but it's not compatible with some of the more powerful distortion filters.)

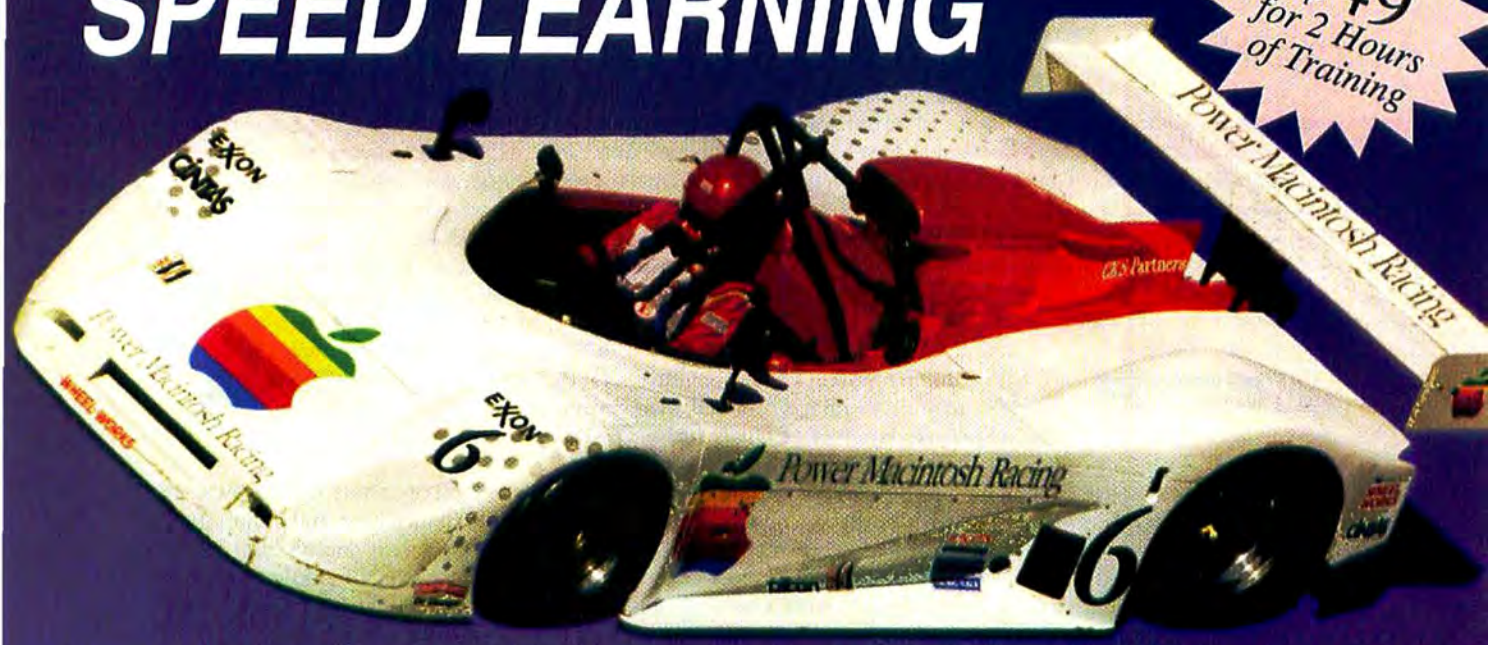
The 14 tools on PhotoFlash's tool palette include a variety of standard selection tools, as well as tools for cropping, resizing, rotating, blurring, and sharpening. Two unique tools are DeDust, which automatically removes specks in otherwise solid fields of color, and DeScratch, which removes thin scratches that might mar a scanned image. Predictably, it's sometimes difficult for PhotoFlash to distinguish between genuine hairline scratches and normal portions of a complex image, so these tools must be used with caution. Fortunately, you can fine-tune their sensitivity using the Enhance dialog box.

PhotoFlash includes cataloging features that let you quickly organize groups

continues

SPEED LEARNING

Only $49 for 2 Hours of Training



Save Hundreds of Hours and Thousands of Dollars by Using th MacAcademy Video Training Series

The MacAcademy Video Library

4th Dimension
1 2 3 4 5 6
Canvas
1 2 3 4 5
ClarisWorks
1 2 3 4 5 6 7
Design & Layout
1
Director
1 2 3 4 5
Electronic Desktop to Pre-Press
1 2
Excel
1 2 3 4 5
FileMaker Pro
1 2 3 4
Fonts
1
FreeHand
1 2 3 4
HyperCard
1 2 3
Illustrator
1 2 3 4 5
Infini-D
1 2
Integrating Programs
1
Lotus 1-2-3
1 2 3
Macintosh Basics (7.1 or 7.5))
1 2 3 4
Mac P & L
1 2 3
MacProject Pro
1 2 3 4
MacWrite Pro
1 2 3
MiniCad
1 2
Networking
1
Nisus Writer 4.0
1 2 3 4
Now Contact & Now Up-To-Date
1
PageMaker
1 2 3 4 5 6
Painter
1 2 3 4
Peachtree Accounting
1 2 3
Persuasion
1 2
Photoshop
1 2 3 4 5 6 7 8 9 10
PowerBooks
1 2
PowerPoint
1 2
Premiere
1 2 3
QuarkXPress
1 2 3 4
Quicken
Personal 1 2, Business 1 2
QuickTime
1
SuperPaint
1 2 3
Troubleshooting
1 2 3
Utilities
1
Word
1 2 3 4 5 6
WordPerfect
1 2 3 4 5 6
Works (Microsoft)
1 2 3 4 5

The numbers listed under the titles indicates number of videos available.

Clip Art FREE For Ordering The Video Training Series

Daytona Beach... We know the need for SPEED. The MacAcademy Speed Learning System will quickly bring you up to speed on your Apple Macintosh and PowerMac computers. This award winning solution for effectively mastering the Mac and application software for the Mac will teach you the power of the operating system and all the new features, tips, and techniques of the software applications. If you haven't taken advantage of this dynamic training solution, we want to make you this special limited offer... Select a training series from the library of over 40 different software applications, and we will send you a special clip art package of 100 color images FREE.

To Order or for a FREE Catalog Call

800-527-1914

FAX 904-677-6717

We feel that you will find our MacAcademy video training series an invaluable learning source. However, if you are not completely satisfied you can return your videos within 30 days for a full refund, and the Clip Art package is yours to keep for ordering the Speed Learning System.
$49 per video: credit cards, checks, and purchase orders are accepted. Please add $3 per order, plus $1 per video, shipping and handling.

Be sure to include the Department Code to get the FREE Clip Art.

Department MW795
100 East Granada Blvd.
Ormond Beach, FL 32176-1712

Training Alliance Member

MacAcademy®

Circle 106 on reader service card

© FMI 1995

of images in searchable catalogs. Images are displayed as thumbnails and can be sorted by file name or date. You can add an image to a catalog simply by dragging the image's icon onto an open catalog window. PhotoFlash can catalog the contents of an entire disk by scanning the disk for images and adding to the catalog each one that it finds.

You can search catalogs by file name or by a specific string of caption text, and PhotoFlash will create a new catalog containing images that meet the search criteria. Version 2.0 also allows you to search by sketch—you draw a crude thumbnail using a few basic painting tools, and PhotoFlash will find images that roughly match your sketch. In addition, you can search for an image by similarity; choose an image, and PhotoFlash will automatically select any other images that match it in basic color and composition. I found that PhotoFlash had more misses than hits at finding images based on sketch or similarity, but the feature can be useful as a last resort.

One of PhotoFlash's real strengths is its extensive support of AppleScript. PhotoFlash comes with several useful scripts that automate the program's functions and integrate it with other applications. Scripts can place an image in QuarkXPress, PageMaker 5.0, Persuasion 3.0, Word 6.0, and FileMaker Pro 2.1 layouts. To record a new script, you simply click on the Record button located on the floating script palette, perform a series of actions, and then save the script.

Photos from Scratch PhotoFlash includes tools designed to wipe out scratches and specks that appear on photographs. The Enhance dialog box shown here lets you fine-tune the behavior of the tools and preview their effectiveness.

The Last Word

PhotoFlash doesn't have the image processing capabilities of Photoshop—but it also costs about $800 less. It handles all the basic image-enhancement tasks a casual desktop publisher is likely to need and provides a simple, uncluttered interface for organizing images, improving their general appearance, and placing them in other programs.—JOSEPH SCHORR

CreativePartner

Network System for Creative Media

PROS: Intelligent approach to working with creative content over a network; faster transmission speeds than LocalTalk; tracks job traffic for project billing and administration. **CONS:** High price; weak implementation of text memo labels; can't transmit folders; lacks some sophisticated integrated-production tools. **COMPANY:** emotion Inc. (415/812-9000). **LIST PRICE:** $1500; five copies plus administrator's license $7500.

MW ★★★

FOR MEDIA PRODUCERS, THE venue for creative group collaboration is moving away from the cozy oval conference table and toward a wider circle of networked contributors. To facilitate this long-distance idea sharing, emotion Inc. has developed CreativePartner, a distribution system for video, sound, text, and graphics.

CreativePartner is a networking solution for people who think visually and communicate best by pausing a videotape and gesticulating around a TV monitor or scribbling across a project storyboard. Now, instead of faxing your producer the fifth-generation copies of your sixth revisions, you can draw or comment over a QuickTime movie and send it quickly to the dispersed creative team for review.

Bouncing Ideas Around

Using emotion Inc.'s CreativeNote annotation system, CreativePartner cleverly stores comments in a separate overlay file, making it unnecessary to send the original movie file after every round of changes. The product also logs all information exchanges for easy tracking, schedules delivery times, groups recipients for batch transfers, and even copes well with the imperfections of network transmission. When a connection is broken, CreativePartner reestablishes the connection and resumes transmitting data from the point of interruption—something that will appeal to anyone who has tried to transmit a 200MB file and had to resend everything from scratch after a last-second glitch. Last, I must laud how efficiently data is packeted and processed. The session-layer interface for AppleTalk has been optimized for large files, resulting in transfer rates that are two to three times as fast as unenhanced AppleTalk.

Not the Full Nine Yards

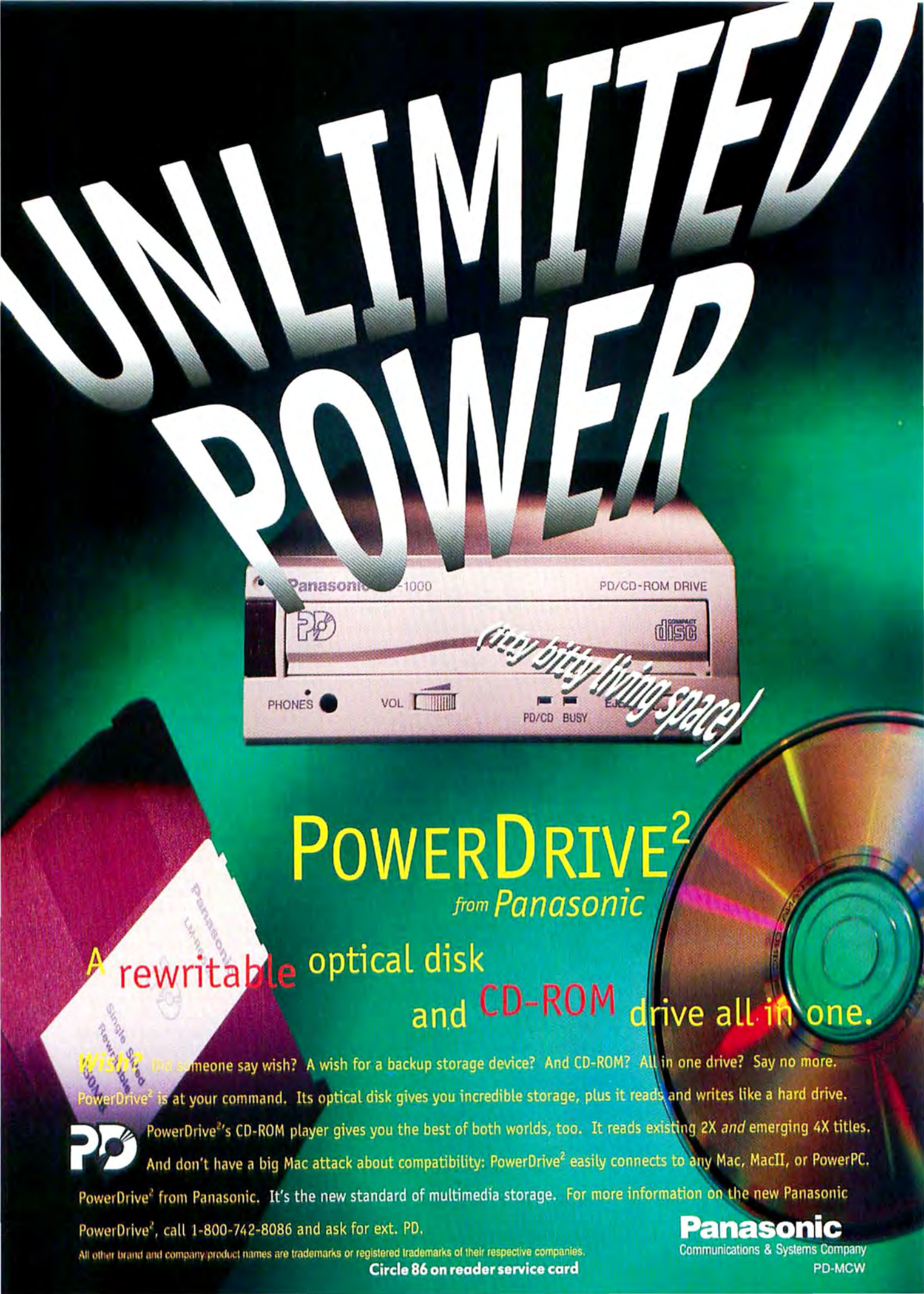
This is all extraordinarily nifty, but the product loses some luster when you stop to consider its price. The distribution and reviewing systems are useful, but for the price, I expect more from software claiming to be my partner. Often there is no way to establish the viability of an idea other than to try it out—and let's face it, CreativePartner is partly competing against my ability to make some media revisions and throw them on an optical disk or VHS tape and courier them to other members of my team. CreativePartner's annotation tools convey basic feedback, but I'd like to see additional tools that would enable you to better visualize effects, compositing, or rough edits without manipulating the movie in a complicated stand-alone program. It would also be useful to have simple scripting functions so someone could send various visual samples and have them play in a specified sequence without having to spend time editing the pieces together.

Note Changes CreativePartner not only accelerates file-transmission speed, but it also allows users to type or scribble annotations right on top of QuickTime images.

The Last Word

It's hard not to get excited about a product that shows me a glimpse of how I'm likely to work in the near future. And in my enthusiasm to embrace this future I can cheerfully ignore some of the version 1.0 annoyances, such as the inability to send a folder of data, or how the interface makes it easy to overlook the "label" (CreativePartner's version of a cover page). For high-end production outfits that have already invested in a hefty ATM bandwidth, the price of CreativePartner licenses might seem a pittance, and such users may find the significant improvement in network transmission speed alone worth the price.

However, I can't help thinking that the product should either be more modestly priced or have a more generous feature set. At this point, CreativePartner feels more like a CreativeAssociate and shouldn't be given a partner's salary.
—AVI HOFFER


UNLIMITED POWER
Panasonic -1000
PD/CD-ROM DRIVE
PHONES
VOL
PD/CD BUSY
(Tiny bitty living-space)
POWERDRIVE²
from Panasonic
A rewritable optical disk and CD-ROM drive all in one.
WISH? Did someone say wish? A wish for a backup storage device? And CD-ROM? All in one drive? Say no more.
PowerDrive² is at your command. Its optical disk gives you incredible storage, plus it reads and writes like a hard drive.
PowerDrive²'s CD-ROM player gives you the best of both worlds, too. It reads existing 2X *and* emerging 4X titles.
And don't have a big Mac attack about compatibility: PowerDrive² easily connects to any Mac, MacII, or PowerPC.
PowerDrive² from Panasonic. It's the new standard of multimedia storage. For more information on the new Panasonic PowerDrive², call 1-800-742-8086 and ask for ext. PD.
All other brand and company/product names are trademarks or registered trademarks of their respective companies.
Circle 86 on reader service card
Panasonic
Communications & Systems Company
PD-MCW

Multimedia Utilities 1.1

QuickTime Utilities

PROS: Versatile utilities; excellent screen recorder. **CONS:** Numerous bugs and rough edges; skimpy manual. **COMPANY:** Motion Works (415/541-9333). **LIST PRICE:** $299.

MW ★★★

MULTIMEDIA UTILITIES IS AN INEXpensive set of six utilities that address most aspects of QuickTime moviemaking, from editing movies and sound tracks to creating morphs, animations, and screen recordings. Sound appealing? It is, and would be more so were it not for some design quirks and enough bugs to scare a can of Raid.

CameraMan 2.5, also available separately, lets you create QuickTime movies of Mac screen activity. You can record full-screen movies or use a framer window to capture only part of the screen. CameraMan lets you simulate smaller screen sizes, too. It can also record simulated mouse-click, keystroke, and error-beep sounds, as well as a live sound track. In all, it's a versatile utility and the crown jewel of the package.

QuickEdit 1.1 is a simple QuickTime movie editor. With it, you can combine movies, create simple cuts between them, and add sound tracks. QuickEdit provides no fancy transitions, such as dissolves, although you can superimpose multiple video tracks and specify how they interact. The latter feature is handy, but you must experiment to find which options do what; the manual barely touches on each utility's advanced features.

A more serious problem is that QuickEdit crashes often. And there are interface quirks: when you click in a track's check box to enable it, for example, you can't see the check mark in the box until you select a different track.

QuickMorph 1.1 is a fun little morphing utility, although it also tends to go south now and then. Creating a morph is a cinch: open two images, and then drag control points to indicate the corresponding points on each image. A dialog box lets you specify the length of the final sequence. The resulting morphs are adequate for the morphing tinkerer.

MotionPaint 1.1 lets you create animations and paint on QuickTime movies. MotionPaint sports the same tools as in color paint programs, including an airbrush, a magic wand, and an eyedropper. MotionPaint lets you paint individual frames of movies. You can specify that the previous frame appear superimposed, but dimmed, over the current frame; this makes it easier to correctly position items in the current frame. MotionPaint can also import and export PICS files.

SoundMate 1.1 is a basic sound-editing utility that lets you record, play, and edit 8-bit or 16-bit, mono or stereo sounds at sampling rates of up to 44.1kHz. You can save recordings as QuickTime movies, System 7 sound files, audio interchange (AIFF) files, Windows-format WAV files, and sound resources. SoundMate also lets you add echo, play a sound backward, amplify a recording, and create a fade-out. It doesn't provide as complete an array of effects as Macromedia's SoundEdit 16, though.

As do many of its companion programs, SoundMate has quirks. Change a sound's sampling rate, and the time-line rulers become inaccurate. Worse, if you choose Undo after deleting part of a stereo sound track, the program doesn't restore everything you deleted.

Multimedia Utilities Two members of the Multimedia Utilities team: QuickMorph (note the grid mesh indicating which parts of the images correspond) and SoundMate (visible in the background).

MovieClick 1.1 lets you add hot spots to QuickTime movies, which when clicked play other movies, sounds, or pause for a specified time. You can also specify transitions, such as wipes, when one movie switches to another. The result is an interactive movie. Unfortunately, MovieClick crashes regularly.

The Last Word

So why does Multimedia Utilities rate three stars? The CameraMan screen recorder is an excellent tool—solid and fully featured. And each of the remaining five programs serves its intended purpose, provided you save often. If you don't mind a skimpy manual and some bugs, give Multimedia Utilities a try. And look to the future: Motion Works is aware of the problems in version 1.1, and plans an update that will fix them.—JIM HEID

ProTerm Mac 1.0

Telecom Software

PROS: Fast, reliable, stable performance; excellent manual. **CONS:** Lacks built-in help and AppleScript support. **COMPANY:** InTrec Software (602/992-5515). **LIST PRICE:** $129.95.

MW ★★★★

PROTERM FROM INTREC SOFTware is a Macintosh version of a program that has long been available for the Apple II. Although on the surface it looks like just another no-frills communications program, it offers a level of sophistication that belies its small size and relative ease of use.

The entire package—application and support files, including drivers for most popular modems—fits on a single 800K disk. You copy the application folder to your hard drive and start the program. There is no installer application and no need to restart the Mac.

ProTerm offers a standard mix of telecommunications features. It supports the most commonly used file-transfer protocols, including Xmodem, Ymodem, Zmodem, and Kermit. There are a number of terminal emulations to make your connections compatible with all types of services, including the standard TTY and some more-obscure services, such as PSE/A2 and TeleVideo 910. An integrated text editor allows you to compose messages offline to avoid high connect and online expenses. You can also use the editing window to export text captured during your telecommunications sessions for use in a word processing or desktop publishing program.

Creating macros in ProTerm can be as simple or as complex as you like. As with MicroPhone Pro from Software Ventures and White Knight from FreeSoft, you can have ProTerm record your BBS log-on steps and other procedures by using its AutoLearn feature. If you require more-sophisticated scripting per-

continues

Keeping It Basic A simple terminal window shows the progress of your online sessions.

Before you buy a color printer, you'd better double-check your facts.

STANDARD FEATURES

	PROFESSIONAL COLORPOINT 2 MODEL 4/14	TEKTRONIX PHASER 440/480
DUAL TECHNOLOGY	√√	
ADOBE POSTSCRIPT LEVEL 2	√	√
33 MHZ RISC PROCESSOR	√	
135 ADOBE TYPE 1 FONTS	√	
AUTO TRIM (Automatically cuts paper/OHP)	√	
INTERNAL HARD DISK (No additional RAM needed)	√	
4-COLOR FULL-BLEED PRINTING (Right out of the box!)	√	
INDUSTRY-STANDARD COLOR MANAGEMENT	√	
DCS FILESUPPORT	√	

Do the research and you'll discover that the Professional ColorPoint 2 is twice the printer of any of its competitors. It has all the features you want standard, so you can print full-bleed, 4-color pages right out of the box. Plus, with Seiko Instruments' unique Dual Technology, it's like getting two printers for the price of one.

Dual Technology means the Professional ColorPoint 2 can output both thermal wax transfer and dye sublimation prints. Use the thermal wax transfer mode to output inexpensive ad, collateral, and packaging comps, or rough drafts of brochures and presentations. Then switch to dye sublimation mode when you're ready to print high-quality, photorealistic final output. So instead of being tied to the higher cost of materials with a dye sub-only printer, you'll save thousands of dollars on supplies by using thermal wax transfer during your proofing stages.

Check it out for yourself. For free sample output and a brochure on how the Professional ColorPoint 2's Dual Technology can save you up to forty thousand dollars a year in output costs, or for a free demonstration, call **800-888-0817.**

SII
Seiko Instruments

Circle 93 on reader service card

©1994 Seiko Instruments USA Inc. Professional ColorPoint2 is a trademark of Seiko Instruments USA Inc. Postscript Level 2 is a registered trademark of Adobe Systems Inc.

formance, you can use ProTerm's DIRC macro-programming language to build macros from scratch and to automate very complex telecommunications routines, which you can then recall with simple keystrokes.

If you're new to the sometimes confusing world of telecommunications, you'll want to study the manual thoroughly before diving into the program. There's no built-in help, and some of the menu commands may be a bit confusing for beginners. But the manual is especially deserving of praise. It's written more like a textbook than a typical software manual. Arcane telecommunications terms are explained in simple language, and the authors carefully guide you through the simple steps of setting up the software and connecting to a BBS, and then they take you with great dexterity through the maze of download protocols, terminal emulations, and finally, scripting.

Buying version 1.0 of a software package can be risky, but ProTerm has a level of sophistication and robustness you don't find in a typical initial release. And in terms of performance there's little to criticize. Connections to your favorite BBS or online service are quick and true. The AutoLearn feature works reliably for routine name and password entries without need of editing. The program runs stably and predictably in all respects. Although not native for the Power Macintosh, ProTerm was a brisk performer on my 8100/80.

One particularly useful feature is ProTerm's Connect List, which allows you to build a list of the services you regularly visit, and then have the program connect to them, one right after the other, automatically calling up one service as soon as you log off the previous service. The program can also create an activity log, so you can see just which service was contacted and when.

If there is anything to criticize in ProTerm, it's that it paves no new ground in running your communications sessions. It is a text-based program for accessing text-based services, with no fancy icons or pretty front end to ease navigation through such services.

The Last Word

Despite the program's lack of truly innovative features, I was pleased with ProTerm Mac. Whether your telecommunications needs involve simply logging on to online services and various BBSs or you have sophisticated, complex scripting requirements in mind, you should definitely consider ProTerm for handling your communications chores.

—GENE STEINBERG

CD Accelerators

Utilities

CD Directory 1.0

PROS: Permits renaming and reorganizing catalog contents; catalogs are network-shareable. **CONS:** Cataloged CDs treated as local drives, slowing Finder searches. **COMPANY:** Insignia Solutions (415/694-7600). **LIST PRICE:** $69.95.

MW ★★★★

RapidCD 1.04

PROS: Configurable optimization settings; supports multiple CD-ROM drives; audio autoplay feature. **CONS:** Can't control disk drive used for caching; can't add to predefined settings; not compatible with AppleCD Audio Player. **COMPANY:** Insignia Solutions (415/694-7600). **LIST PRICE:** $69.95.

MW ★★★

RAPIDCD AND CD DIRECTORY, A PAIR of utilities from Insignia Solutions, improve CD-ROM performance and usability. RapidCD provides both RAM and disk caching of CD data, speeding access to frequently used data. CD Directory stores catalogs of CD directories on your hard drive, letting you access those directories at hard drive speeds. Both products include well-written, indexed user's guides.

RapidCD replaces your existing CD Driver extension. It lets you configure RAM and disk caches ranging from 128K to 4MB. If you have multiple CD-ROM drives, RapidCD lets you configure independent caches for each. While some other CD cache utilities restrict cache sizes to under 1MB, RapidCD's 4MB cache capacity takes advantage of the larger configurations of newer Macs. The dual RAM-and-disk cache arrangement means that cache contents persist across system restarts, improving the likelihood of cache hits, and thus overall performance. In tests of CDs ranging from clip-art collections to multimedia presentations, RapidCD lived up to its name.

RapidCD's control panel also lets you select from four kinds of cache optimization: General, Finder, QuickTime, and Database. They control how cache activity is divided between the RAM and disk caches. Unfortunately, you're limited to the selections provided.

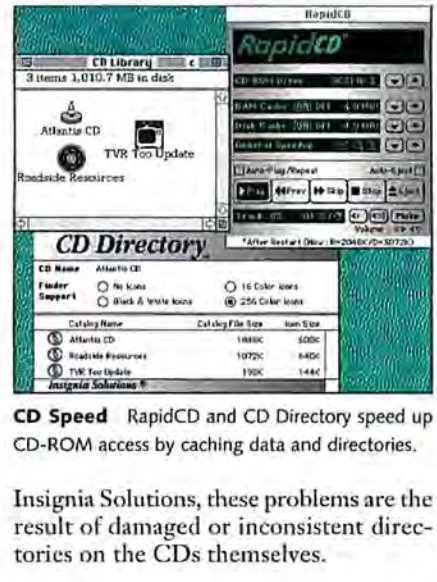
RapidCD's control panel also includes an audio CD player. It works well but lacks the features found in Apple's AudioCD utility. Unfortunately, RapidCD is incompatible with AudioCD.

CD Directory automatically catalogs CDs when you insert them, storing the catalogs on your hard drive. You then access the catalogs through a desktop icon named CD Library. You can rename items in a catalog and reorganize them—CD Directory will still find the original items. The CD Library looks like a disk volume, so you can share it on a network.

You can access the directories from within any Mac application, including directory-search utilities like System 7.5's Find File. However, such utilities can't distinguish the directories from mounted volumes. Thus a global search of local drives will include the CD catalogs, greatly increasing search time.

CD Directory catalogs CDs on insertion, a process that takes from a minute or two to nearly an hour, depending on the speed of your CD drive and the number of items on the disc. CD Directory's control panel lets you control the catalog-building process, setting it to off, automatic, or automatic with user confirmation. You can also reduce the ultimate catalog size and cataloging time by capturing fewer icon colors or no icons at all. An edit window displays the size of each catalog on your hard drive.

Although CD Directory works well with most CDs, some discs have formatting peculiarities that cause the catalog-building process to fail. According to Insignia Solutions, these problems are the result of damaged or inconsistent directories on the CDs themselves.



CD Speed RapidCD and CD Directory speed up CD-ROM access by caching data and directories.

The Last Word

Both RapidCD and CD Directory do their jobs well, and even help each other out when used together. In particular, CD Directory's elegant, transparent interface makes it a valuable tool for Macintosh users working with lots of CDs.

—MEL BECKMAN

Toyota wants to DRAG you CLICKING and SCREENING into the 21st CENTURY.

Imagine SEEING live footage of every Toyota Car, Truck, SUV and Van in any COLOR or from any ANGLE, right in front of your EYES. With all the information of every brochure right at your fingertips. All in STEREO. That's what you get with Toyota's new CD-ROM. And there's MORE: motorsports and racing coverage, manufacturing information, EASY explanations of Toyota's LATEST technologies, even a dealer locator.

So even if you don't know bits from bytes or highways from superhighways, at least you'll know EVERYTHING about Toyota. Call 1-800-GO-TOYOTA for your free Toyota CD-ROM today.

TOYOTA

I Love What You Do For Me

©1995 Toyota Motor Sales, U.S.A., Inc. Buckle Up! Do it for those who love you.

OptiMem RAM Charger 2.0.1

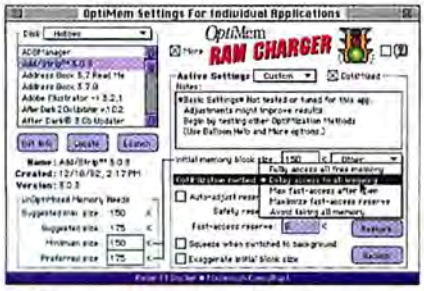
Memory-Management Utility

PROS: Makes the Mac manage memory more efficiently; good interface and documentation. **CONS:** Requires tweaking for maximum benefit; default settings occasionally lead to instability. **COMPANY:** Jump Development Group (412/681-2692). **LIST PRICE:** $129.

MW ★★★★

OPTIMEM RAM CHARGER 2.0.1 MAKES your Mac use memory more efficiently, and in so doing lets you use your Mac more efficiently.

Normally, a Mac application occupies as much RAM as is specified in its Get Info window. It reserves RAM in a block, neither releasing unneeded RAM nor taking additional RAM. If you launch two programs and then quit the first, you have more free RAM, but it's in two noncontiguous pieces. With 8MB total RAM free but in separate 4MB blocks, you can't



OptiMem Options A wealth of parameters allows you to tailor OptiMem RAM Charger's performance to the quirks of individual applications.

open an application that needs 6MB of RAM. And you may not know you're low on RAM until you run out.

OptiMem RAM Charger changes all that. It opens applications in smaller blocks of RAM. An application that needs more RAM can take RAM from any free block, then release that RAM when it's no longer needed. OptiMem can relocate blocks of occupied RAM to avoid fragmenting free RAM, so you can launch larger applications without quitting open ones. Finally, if RAM does run low, a traffic light over the Apple menu warns you.

Managing Your Memory

To use OptiMem, you can just run the Installer and restart. But to make the most of it, you should take control. The OptiMem's control panel reports on total available RAM, the largest free block, and details of what you've saved and what's in use. From there, a button-click takes you to the OptiMem Settings application, where you can enable or disable OptiMization for any application, then fine-tune the settings for each one with an impressive array of options—all detailed in the concise and witty manual.

You can also have OptiMem automatically OptiMize programs new to it and notify you when it does; select modifier keys that toggle OptiMization of applications on launch; and set the threshold for the low-memory warning.

OptiMem RAM Charger comes preconfigured to run many popular applications efficiently, and its defaults work fine with most applications it doesn't know. Still, it takes experimentation to make new programs work optimally with OptiMem. Fine-tuning my settings let me save several more megabytes of RAM, with no discernible loss in performance.

Charging Ahead

To test OptiMem, I loaded application upon application, and my Mac just kept on ticking. When I pushed the limits, OptiMem warned me, and when I hit those limits, it told me which program to quit so another could launch or a running one could get the RAM it needed.

Ordinarily, taxing the Mac's memory this way might lead to unexpected quitting, but OptiMem can, as advertised, make your system more stable. I had a few crashes and slowdowns from programs that didn't like the factory settings. I fixed this easily enough, but until I did, I was trading old problems for new. Of the dozens of programs I tested, only one refused to run OptiMized: Symantec's MacTools Pro. Once excluded, it ran flawlessly alongside OptiMized programs.

The 64K question is, How does OptiMem compare with Connectix's RAM Doubler? Trick question. Because the two work in different ways, they don't compare directly. Moreover, they make a great team; with both installed, my 16MB of RAM looked like 32MB and worked more like 64MB. Unlike RAM Doubler, OptiMem works on every Mac back to the Mac Plus. It requires System 7, but it helps make System 7 practical for Macs limited to 4MB of RAM.

The Last Word

OptiMem was already neat when it had fewer features yet was clunkier to use. OptiMem RAM Charger makes a good idea great, and at a $50 street price it's a bargain. The Mac OS ought to work this way already. Until it does, there's OptiMem RAM Charger.—PETER M STOLLER

MacAlly

ADB Mouse

PROS: Inexpensive; same shape as Apple mouse; glides easily. **CONS:** Annoying warranty-registration requirement. **COMPANY:** The Mace Group (213/780-6110). **LIST PRICE:** $49.

MW ★★★

AS COMPUTERS COME CLOSER AND closer to becoming commodity items the way toasters and VCRs have, so do input devices. Macintosh users looking for a new mouse or trackball now have a wide variety of vendors to choose from. The MacAlly mouse is one that does the job without standing out from the crowd.

The MacAlly mouse looks like the Apple ADB mouse, with its rounded contour and single large button. Its button provides the same degree of auditory and tactile feedback as Apple's. Plastic feet on the MacAlly mouse make it glide even a bit more smoothly than the Apple mouse. Subjected to normal day-to-day use, however, the MacAlly mouse was indistinguishable from the Apple ADB mouse.

Underneath, a plastic cover twists off when you need to clean the ball and rollers. I tried disassembling the MacAlly to check its internal construction, but the housing wouldn't pry apart even after I removed both visible screws. Overall, though, the mouse seems adequately durable, and it stood up well to rough treatment over several weeks of testing.

TOM GRISON

The documentation says that the 12-month warranty is invalid unless you send in the registration form (a requirement that may not be valid in some states).

The Last Word

If you can spend about $50 more, Kensington Microware's programmable Thinking Mouse is worth considering (see *Reviews*, *Macworld*, May 1995). But the MacAlly mouse does a competent job at an unbeatable price.—FRANKLIN TESSLER

POWERLOOK out-powers the competition!

LIMITED TIME OFFER

FREE

Live Picture

Image Editing Software by HSC™

Market Value $995

WITH POWERLOOK MAC

HOT SWAP!

PowerLook's One-Year Manufacturer's Exchange Program. Call **800-859-2728** for program details or product info.

(U.S. Residents Only)

Scan With a Winner!

For all your professional graphics and prepress needs, get the UMAX PowerLook. It's "probably the fastest flatbed scanner ever made," says HOW magazine. PowerLook's award-winning combination of blazing speed and superior image quality knocks out the competition every time. PowerLook is powerful, yet "fast (and) easy to use," according to MacUser magazine. And PowerLook comes with UMAX's own MagicScan, intuitive software that gives you scanning domination. So for consistent, unbeatable quality, team up with PowerLook and put yourself in the winner's circle.

Call 800-859-2728 for more information today!

PowerLook Extra Value Bundles:

PRO-PLUS BUNDLE for Mac or PC	SE BUNDLE (Mac Only)
PhotoShop™ FULL for Image Editing	PhotoShop™ LE for Image Editing
HSC Kai's Power Tools™ SE	Pixelcraft QuickScan™
HSC Kai's Power Photos™ CD	Pixelcraft Color Access™ (for Color Separation)
Pixar Typestry™ & 128 Textures CD	

SCSI-II Free Card with PC Bundles!

UMAX

© 1995 UMAX Technologies, Inc. 3353 Gateway Blvd. Fremont, CA 94538. (510) 651-8883. Product Info Fax Back (510) 651-3710. UMAX is a registered trademark of UMAX Technologies, Inc. Above offer for PowerLook Mac version and $150.00 rebate for PowerLook PC version offer valid 4-15-95 thru 8-15-95 only. Photo Image created by George Kander using the UMAX PowerLook. Trophies and medallions are superimposed with award logos and do not represent actual awards.

Circle 196 on reader service card

GlidePoint

Input Device

PROS: Uses very little desk space; can be used in any orientation; requires less arm movement than other input devices. **CONS:** Dragging is more awkward than with a mouse. **COMPANY:** Alps Electric (408/432-6000). **LIST PRICE:** $99.

MW ★★★

FOR COMPUTER USERS WHO ARE IN pain every time they use a mouse, the ideal pointing device would require no arm motion at all. While that's not yet practical for most people, the Alps GlidePoint lets you control the cursor with a minimum of effort, using the same technology as the Trackpad built into Apple's 500-series PowerBooks. (For a look at another Macintosh touchpad, MicroQue's QuePoint, see *Reviews*, *Macworld*, May 1995.)

At 3 by 3 inches, the GlidePoint is compact, and it actually requires less work space than a mouse. It comes with an ADB cable and extension cord that stretch over 6 feet, and the device is compatible with desktop Macs and PowerBooks. Four rubberized feet on the bottom prevent the GlidePoint from sliding around during use. Aside from its three buttons, the GlidePoint contains no moving parts, and the pad is sealed to protect it against dirt and moisture.

The GlidePoint is as intuitive as any pointing device can be: you simply move your finger in whatever direction you want the cursor to go. Unlike most drawing tablets, where every position on the tablet corresponds to an absolute screen location, the GlidePoint uses relative positioning: if you lift your finger and move it to another spot, the cursor stays put. (The manual recommends that you use your index finger to point. The GlidePoint senses the interaction between your skin and a weak electrical field, so you can't use a pen, pencil, or fingernail instead of your finger.)

It takes some practice to learn to control the GlidePoint's cursor precisely. Fortunately, you can adjust the device's sensitivity using a supplied control panel. The control panel lets you specify the GlidePoint's orientation in 90-degree increments, so you can use it with the tablet facing any direction (the software automatically compensates for the position of the buttons). You click or double-click by tapping the GlidePoint lightly once or twice. To drag the cursor, you tap twice and then slide your finger without removing it from the pad; unfortunately, the GlidePoint's surface is small and your finger reaches the edge of the tablet before you've completed a dragging operation, forcing you to start over. You can program any of the GlidePoint's three buttons to click up to three times or drag-lock when pressed. (You can also program the buttons to activate simple keyboard shortcuts like cut and paste.) I found it difficult to activate the buttons without lifting my index finger from the pad, however.

KEVIN CANDLAND

The Last Word Although I still prefer using a mouse, the GlidePoint is an attractive, cost-effective alternative for people who can't tolerate a conventional pointing device. It's also worth looking into if you're really short on desk space. As with all input devices, though, remember to audition the GlidePoint thoroughly before you buy it.—FRANKLIN TESSLER

FolderBolt Pro 1.0.3

Security Software

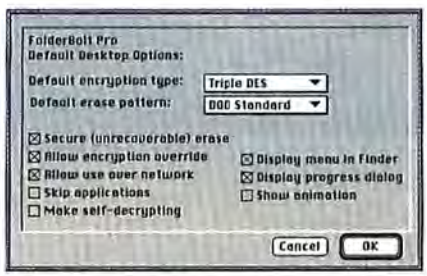
PROS: Top-notch encryption schemes; flexible access controls. **CONS:** Access controls require some low-level directory manipulation. **COMPANY:** Kent Marsh (713/522-5625). **LIST PRICE:** $129.95.

MW ★★★★

FOLDERBOLT PRO LETS YOU secure data on your Mac by "bolting" folders via password protection and encrypting the enclosed data. Bolting folders requires some rearranging of the disk directories that the Mac uses to display files and folders. While such low-level rummaging around in your system sounds complicated and potentially hazardous, it's really not.

FolderBolt Pro's interface is simple and straightforward. You secure folders from the desktop, using a pull-down menu in the Finder's menu bar. A dialog box asks you for a password and then offers four ways to secure the folder: Bolt, Deadbolt, Read-Only, or Drop Folder. Bolt restricts a folder's access to users who know the password. Deadbolt both locks the folder and encrypts the enclosed files. Read-Only allows users to view the contents of a folder but doesn't let them make any changes. Drop Folder lets users save to a folder but doesn't let them view or change files inside.

Think of the bolting features as a fairly strong deterrent, not as complete protection for your files. Both System 7.5's Recent Documents feature and Now Software's SuperBoomerang can open unencrypted documents inside bolted folders. And a professional data thief or an experienced Macintosh user who really wants access to your data can bypass the bolting protection with a low-level disk editor, although doing so requires time and effort.



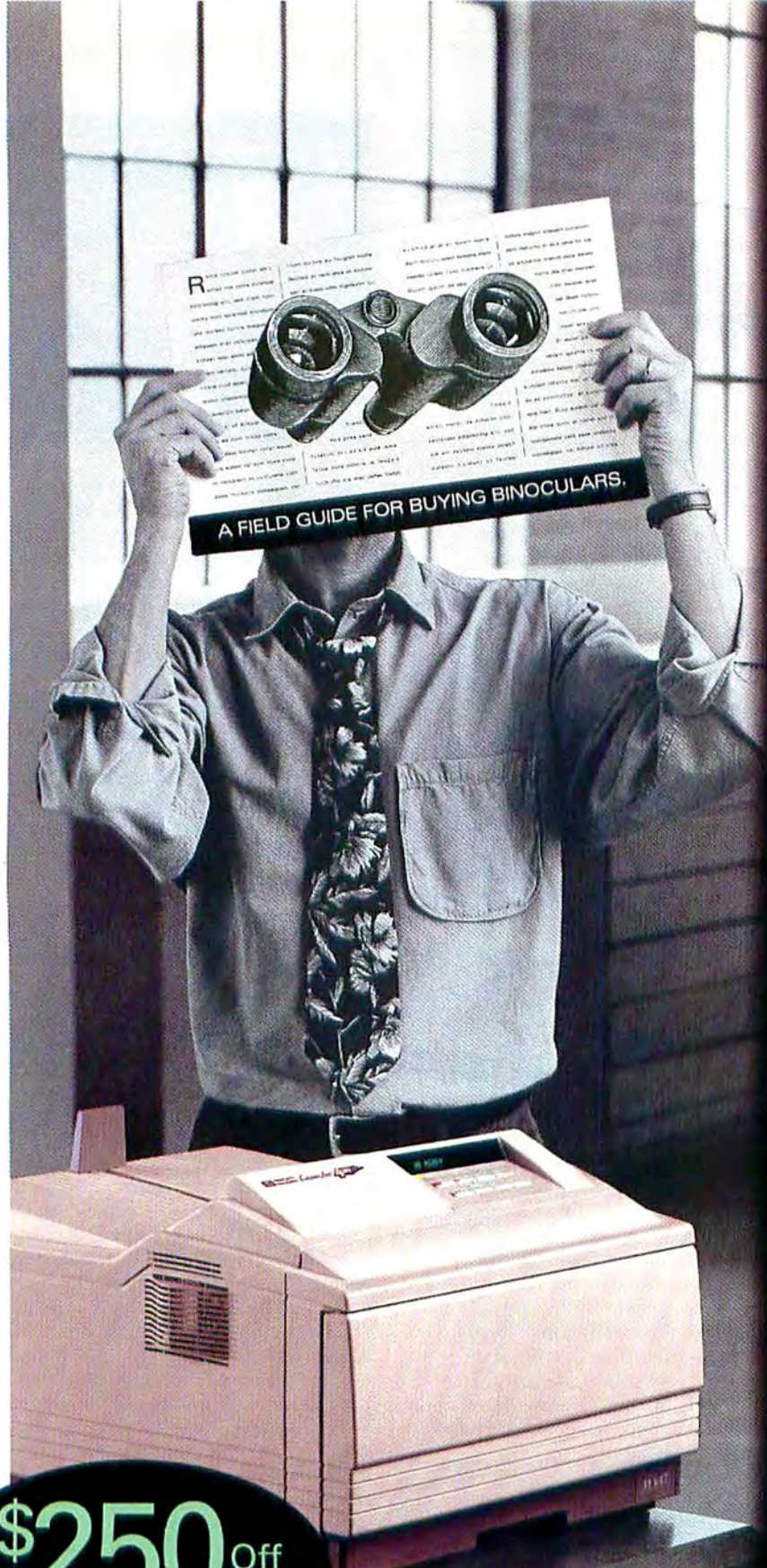
Lock, Stock, and Folder You can customize FolderBolt Pro's security features by varying your preferences in this dialog box.

For additional data security, you'll want to use FolderBolt Pro's encryption features.

FolderBolt Pro lets you encrypt files individually or as part of the bolting process. It even lets you create password-protected, self-decrypting files for sharing with users who don't have the application. The five encryption modules range from the company's proprietary schemes, which shield your files from casual snooping, to the supersecure triple DES national standard, which keeps even the FBI's best code breakers out of your business. It takes longer to encrypt and decrypt your data using triple DES (2½ minutes on a Quadra 700 for a 230K word processing file, or 20 seconds for the same file on a Power Mac 6100/66), but that's a small price to pay for security.

For emergency access (such as when you've lost your passwords), FolderBolt Pro includes a master-key application that overrides all security on files locked with the same copy of FolderBolt Pro. The master-key application also keeps logs, sets preferences, and lets administrators customize the security features on their networks.

The Last Word Easy-to-use FolderBolt Pro provides solid protection for sensitive files. Given the state of computer security these days, we should all be locking our digital doors a lot more than we used to. FolderBolt Pro is a worthy addition to your computer keychain.—MATTHEW HAWN



Size it up.

Tabloid-size output for under $3,000* with the HP LaserJet 4MV.

Now you can see your designs in all their glory. The LaserJet 4MV printer not only delivers oversize output, it gives you a full-bleed at 11″ x 17″ after trimming. And, if you're going to have it big, you might as well have it fast. So this LaserJet handles a variety of paper sizes with a 16-ppm engine. Tabloid-size prints at 9 ppm. In addition to superior 600 x 600-dpi print quality, your complex graphics benefit from HP's Resolution Enhancement technology, 12 MB of standard memory and more than 120 levels of gray in Adobe™ PostScript™ language or enhanced HP PCL 5. Of course the LaserJet 4MV is totally Mac compatible. LocalTalk and Ethernet mean it's network ready – for any environment. But the best part is that it'll cost you less than $3,000. Call for more information and print samples.† And get the big picture.

HP LaserJet Printers

HEWLETT® PACKARD

$250 Off HP LaserJet 4MV

Offer good thru 7/31/95

*Average U.S. retail price. Actual price may vary. Adobe and PostScript are trademarks of Adobe Systems Incorporated which may be registered in certain jurisdictions.
©1995 Hewlett-Packard Company. PE12544
†**Call 1-800-LASERJET, Ext. 9177.** In Canada, call 1-800-387-3867, Dept. 9177.

FullPixelSearch 1.5

Image-Analysis Software

PROS: Unique; easy to use; fast. **CONS:** Slender documentation; some needed features yet to come. **COMPANY:** Avian Systems (201/224-2025). **LIST PRICE:** $1295.

MW ★★★

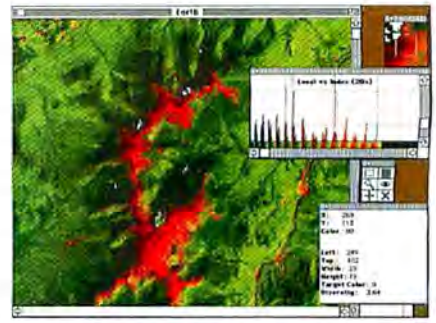
IN MOST MACINTOSH IMAGING, A PICture is just a picture. But in scientific imaging, the picture often represents a set of numbers. This calls for a different kind of image program. FullPixelSearch 1.5 is an especially useful product in this image/numbers-analysis field.

Scientific images are usually constructed in so-called false color: a palette of 8-bit indexed colors represents a range of numbers scaled from 0 to 255. A digitized X ray might show a set of colors scaled to represent density numbers, an image of a flame might show colors corresponding to a range of temperatures, and a satellite image might display colors that index ground-microwave reflectivity. Sometimes the picture itself displays the useful information (an X ray showing a tumor, a satellite image suggesting oil deposits), but typically, further analysis is needed to extract results.

FullPixelSearch lets you do this kind of analysis. With a small palette of tools, it can analyze images 1 pixel at a time, in 8-by-8-pixel blocks, in arbitrarily sized blocks smaller than 8 by 8 pixels, or in image-wide format. For example, if you place the Eye tool over a single pixel, all pixels with the same color palette index value light up in FullPixelSearch's highlighting color (which can even blink to make pixels easier to spot).

The main reason to use FullPixelSearch, however, is to generate pixel-statistic reports with the Search function. Using a variety of pixel-selection functions (the rectangular marquee is most useful), you pick out a group of pixels as a match set. The program then scans the whole image, pixel by pixel, and prepares a text report showing how many pixels' index values fall within the match set. For a researcher looking for possible tiny tumors in a magnetic resonance imaging scan or seeking dwarf stars in a large expanse of night sky, FullPixelSearch is well worth its rather steep price.

The slim documentation assumes user familiarity with scientific-image conventions and palette editors such as NCSA's PalEdit, but that's a reasonable assumption for the program's main audience of professional scientists. The next step up in utility for FullPixelSearch is batch processing of images and consolidated reporting, promised for version 1.75 in summer 1995.



The Blink of an Eye Choosing the Eye icon in FullPixelSearch highlights all the pixels whose index color matches the color of the pixels in the selection rectangle.

The Last Word FullPixelSearch still needs a few more features: batch processing, scripting, and the ability to handle 12-bit and 16-bit images *would greatly* extend its power. But in its domain of pixel statistics it's the only game in town. Upgrades (including a Power Mac version, batch processing, and an Adobe Photoshop plug-in) are free for a year, and version 1.5 as it stands is a remarkable tool for its particular functions.—CHARLES SEITER

YST-SS1010

Speaker System

PROS: Clean, reasonably accurate, undistorted sound; extra input jacks for external CD-ROM player. **CONS:** Poor manual. **COMPANY:** Yamaha Corporation of America (714/522-9240). **LIST PRICE:** $349.95.

MW ★★★★

TYPICAL SMALL MULTIMEDIA LOUDspeakers are seldom capable of good, low bass. Yamaha's YST-SS1010 speaker system is designed to address this problem.

The Yamaha system consists of two magnetically shielded satellite speakers and a subwoofer module. The amplifier and controls reside on the bottom front of the right speaker. In addition to power and volume controls, there's a presence (treble) control for adjusting high frequencies. The subwoofer module has a high/low cutoff switch (which determines the frequency at which the subwoofer takes over), an on/off switch, and a level control. There's a separate set of inputs on the subwoofer for a CD player or other sound source.

The system plays at reasonably loud levels without undue distortion. The satellites output 10 watts per channel, and the subwoofer, 25w. (Since Yamaha doesn't tell which rating technique it uses, there's no way to compare these figures with those of other products.) The subwoofer is supposed to reproduce 35Hz; Yamaha credits its active-servo technology for this level of performance. This technique combines a rounded port (basically a long hollow tube) and a separate negative-impedance amplifier to enhance low-level reproduction.

The biggest failing of this product is the difficulty of getting the system to sound its best. Placement of the satellite speakers is straightforward; they can fit on either side of your Mac or in a similarly convenient location. But where do you put the subwoofer? The all-too-brief instruction booklet provides no hints, nor a suggested subwoofer volume level, nor the proper cutoff-switch setting. Another problem is that the level controls for the satellites and the subwoofer are separate. When you adjust the volume on one, you have to make a corresponding adjustment on the other.

After you've installed it, you'll be pleased with the Yamaha system. In general, I found the sound to be warm and smooth. Bass reproduction was solid and clean. Although the unit doesn't quite have enough power to fill a large room with undistorted sound, it's fine for a typical home office. I compared the system with the Audio-Technica MMS557 speaker system. While the Yamaha's subwoofer provides superior bass extension, the Audio-Technica speakers have a somewhat brighter, crisper sound. You'd be hard-pressed to choose which is better.

ROBERT PERRY

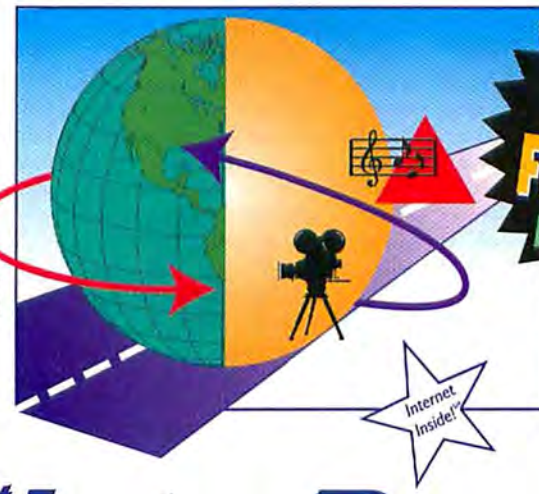
The Last Word Once you get the Yamaha multimedia system set up correctly, the performance is definitely above average for satellite-and-subwoofer systems in general, and very good for a computer speaker. This is a product I can highly recommend.—GENE STEINBERG

Instant InterRamp

5 MINUTES TO FREEDOM

INSTANT INTERNET ACCESS

CONNECT TO THE INTERNET IN LESS THAN 5 MINUTES



7-DAY FREE TRIAL FOR MACINTOSH®

Instant InterRamp℠

Forget on-line services; InterRamp connects you directly to the Internet. That's the BIG difference.

In less than 5 minutes, you'll have access to MOSAIC, Gopher, WAIS, Veronica, Archie, ftp, E-Mail, NEWS and other hot Internet applications. You have the entire world-wide Internet at your fingertips.

Just a few clicks of your mouse, you're connected.

All applications are automatically configured for immediate use. It's that SIMPLE.

We're so sure you'll love Instant InterRamp, we'll let you try it absolutely FREE without any obligation.

All you need is a computer and a modem; we'll send you the Instant InterRamp software.*

Also, PSI offers high-performance LAN Internet solutions for your organization. Ask our sales representative for more information.

PC & UNIX VERSIONS ARE ALSO AVAILABLE

CALL NOW FOR FREE DEMO

1.800.PSI.0852

PREFERRED CUSTOMER NUMBER #00141

PSINet THE INTERNET STARTS HERE

FAXBACK INFO: 1.800.fax.psi.1 • INTERNET E-MAIL: interramp-info@psi.com • WORLD WIDE WEB: http://www.psi.net

DOWNLOAD THE SOFTWARE FROM THE INTERNET: http://www.psi.net/interramp/

Restrictions apply. FREE trial requires credit card for verification purposes only. • PERFORMANCE SYSTEMS INTERNATIONAL, INC. • 510 HUNTMAR PARK DRIVE • HERNDON, VA 22070 • USA • ©1995 Performance Systems International Inc. PSINet and the PSINet logo are registered trademarks. All other trademarks and service marks are used with their permission and remain the property of their respective owners.

Circle 95 on reader service card

Alien Skin Textureshop 1.0

Texture Generator

PROS: Creates a wide variety of seamless-tile patterns; textures can be used as Photoshop filters. **CONS:** Little control over textures' appearance. **COMPANY:** Virtus (919/467-9700). **LIST PRICE:** $99.

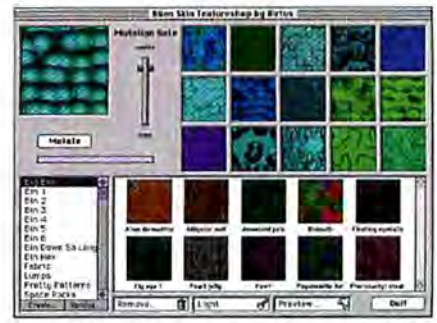
MW ★★★

HERE I AM, SITTING AT MY MAC, applying oodles of mutations to Big Orange Bumps. An odd task, to be sure, but it's all in a day's work for a *Macworld* reviewer. I'm looking at Alien Skin Textureshop (AST), a program that generates patterns that designers can use as backgrounds, surface textures, or other graphic elements in printed or multimedia projects. The patterns that AST creates are seamless tiles, suitable for backgrounds of any size. Patterns can also be used as filters with image-editing programs such as Adobe Photoshop.

AST comes with dozens of prefab textures that run the gamut from wood and stone to reptilian scales to gelatinous goo. You choose a master texture, then adjust a slider to set the degree of "mutation," or changes applied to the original pattern. The program generates 15 textures based on the master texture; you can save any of these you like, name them, and then apply further mutations if you wish. You can organize groups of textures into "bins," which you open from the program's main window.

Once you've created a promising mutation, you refine it by adjusting the color, direction, and reflectivity of light hitting the texture; since many of the textures look 3-D, with peaks and valleys, you can create interesting effects by experimenting with the lighting controls. You can also change a pattern's tile size to increase or decrease a texture's resolution. You may export AST patterns in PICT or CMYK TIFF format for printed documents, or PICT or RGB TIFF for multimedia projects.

Alien Skin Textureshop is easy to use, fun to play with, and a source of countless patterns. Certain personality types will enjoy AST; others may not. Control freaks should avoid it, since one is pretty much at the mercy of random mutations. (Specular International's TextureScape [413/253-3100, $195] creates seamless tiles from imported PostScript images [see *Reviews*, *Macworld*, February 1995], but this added control has a price: TextureScape costs about twice as much as AST.) Likewise, lit-



One Way to Skin an Alien Depending on the mutation rate you select, Alien Skin Textureshop applies subtle or radical changes to a master texture, creating tiled patterns for graphics projects.

eralists looking for realistic natural textures would be better off buying a CD-ROM full of scanned textures, such as those from Artbeats (503/863-4429). So who will find AST useful? People who don't have the time, inclination, or artistic ability to create their own intricate and varied set of patterns.

The Last Word While Alien Skin Textureshop gives you little control over your creations, it does offer a graphics laboratory where experiments can mutate wildly, often producing visually interesting results. When it comes to making bizarre and beautiful patterns, there's something to be said for pressing a button and letting a program do the work.—ERFERT FENTON

Select 1.6

CMYK Color-Correction Plug-in

PROS: Selective-correction mode offers easy-to-understand color tools. **CONS:** Clumsy interface; poor documentation; overpriced. **COMPANY:** Human Software Company (408/741-5101). **LIST PRICE:** $245.

MW ★★

SELECT IS A PLUG-IN FILTER FOR working with CMYK image files from inside Adobe Photoshop and other image processors that support plug-ins. It enables you to make color corrections globally, within a selection, or within a specific color range. This is the kind of operation that color-prepress professionals and graphic artists frequently perform to tweak the amount of yellow in sky blue, say, or to switch a particular red to green.

Select provides two ways to access your color controls. In Gradation mode you control each channel—cyan, magenta, yellow, and black—by adjusting its graphed curve, similar to working with gamma-curve controls. This is handy for correcting color casts and compensating for variations in printing inks. In Selective mode you make changes to a narrowly defined color range—the light-to-medium blues in water reflections and the sky, for instance—that may include combinations of the CMYK colors. Selective mode is good for making dramatic changes to colors that can be easily separated from other colors around them; you might use it to alter a model's eye or lip color, for example.

In Gradation mode you can edit each color channel separately or uniformly change selected channels. Each curve has five control points, which you edit numerically or move along the graph to increase or decrease the color in a particular tonal range. You can introduce additional control points, but you can't, oddly, edit them numerically. The graphs for all four color channels are squeezed into a single screen alongside preview thumbnails. This arrangement results in small curves that are hard to grab and move subtly.

Selective mode is more intuitive than its counterpart in Photoshop, the Replace Color command. It's similar to specifying print colors in percentages of the CMYK colors. Using the eyedropper tool, you first select a "before" color. You can move the before color to the "after" area and either adjust it or select a new after color from the image, or you can define the new color numerically. When you click on the Apply button, Select adjusts any before colors in

Palette Tune-up In Selective mode, you can change up to six colors at once in familiar CMYK percentages.

the image within a specified radius or range of that color to match their after colors. You can correct up to six colors at once.

You can vary the effect on an individual channel by changing its radius setting, but the procedure is a bit confusing because you have no feedback except the small preview. An additional drawback is Select's lack of a clipping alarm to warn you of pixels that might be compromised by changes. Losing color data can produce noticeable shade stepping in what began as a subtle blend.

The Last Word Although its Selective mode provides a convenient and intuitive way to make changes to several colors at once, all of Select's features have equivalents in Photoshop that for the most part are easier to use.—MATTHEW C. NIELSEN

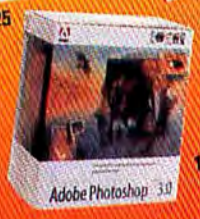
HOT UPGRADES!

17024

21225

17276

16323



19249

FRACTAL DESIGN
17024 Painter 3.0 Mac Upgrade $148.95

CLARIS
21225 ClarisWorks 4.0 Upgrade $49

MACROMEDIA
17276 FreeHand 5.0 Upgrade $148.95

SYMANTEC
16323 Norton Utilities for Mac 3.1 Upgrade $39.95

ADOBE
19249 Photoshop 3.0 Upgrade $148.95

COMMUNICATIONS

21676	CompuServe Value Pack	$25.00
10080	Delrina Fax PRO for Macintosh	59.95
6115	Freesoft White Knight 12.0	85.00
7710	Global Village PowerPort Gold	269.95
20545	Global Village PowerPort Platinum	359.95
17446	Global Village TelePort Gold II	139.95
20544	Global Village TelePort Platinum	249.95
11419	Hayes ACCURA144+FAX144	124.95
18188	Hayes OPTIMA V.34+FAX144	469.95
8478	MDS FaxModem 14.4	99.95
4879	Practical Periph MC144MTII	119.95
17968	Practical Periph MC288MTII V.34	229.95
20392	Prometheus ProModem 28.8 V.34	229.95
16770	Prometheus ProModem144+Voice	119.95
18792	Radish Comm. InsideLine	109.95
7639	STF Tech. FAX*stf* 3.1	64.95
17108	Supra Express 144 Plus	99.95
18831	Supra FAXModem V.34	229.95
6619	Synergy VersaTerm Pro	169.95
11842	U.S. Robotics Sportster 14.4 Fax	129.95
17048	U.S. Robotics Sportster V.34 Fax	274.95
16390	Ventana Press Internet Mem. Kit	49.95
17470	Zoom FaxModem V.34	199.95
14152	Zoom VFX 14.4V FaxMod w/ Voice	149.95

INPUT/OUTPUT

15456	Adesso Extended Mac Keyboard	$69.95
16454	Agfa Studio Scan I for Mac	699.00
2374	CoStar LabelWriter XL+	239.95
16084	Epson Stylus Color Inkjet	549.00
2499	GDT PowerPrint	99.95
17372	HP DeskWriter 540	299.00
20844	HP Mac ScanJet 3C	999.00
17589	Kensington Thinking Mouse	99.95
16212	Mouse Systems MacPoint	29.95
16037	Relisys Avec Designer Scanner	499.00
5438	Microtek ScanMaker II	479.00
15345	Xerox TextBridge OCR Software	74.95

EDUTAINMENT

18246	A.D.A.M. CD	$39.95
13509	Broderbund MYST CD	49.95
13714	Delta Tao Eric's Ult. Solitaire	34.95
20263	Inline Mac 9 Pack on CD	29.95
2316	Lucas Arts Rebel Assault CD	49.95
13818	Maxis SimCity 2000	39.95
3675	Starplay Crystal Caliburn	36.95
14769	Velocity Spectre VR CD-ROM	39.95

NETWORKING

2775	Asanté 8 Port 10BASE-T Hub	$189.00
6677	Asanté Maccon-I Nubus 10-T	109.00
2562	DaynaPORT Ethernet LC *(internal)*	89.95
11499	Farallon EtherWave PN802 Trans.	109.00
14545	Farallon Timbuktu Pro	135.00
18524	MDS 16 Port Hub	299.95
15495	Sonic 5 Port Hub	155.00
15490	Sonic 10BASE-T Transceiver	45.00

STORAGE

16840	Apple External 540MB Drive	$429.95
17793	FWB 700MB Hammer PE Ext.	599.95
16820	Iomega Bernoulli 230MB Remov.	499.95
16852	Iomega 230MB Cartridge	99.95
18148	MDS Ext. 365MB Quantum HD	299.95
17960	MDS Ext. Chinon 525 2x CD-ROM	159.95
15950	MDS SyQuest 200MB Drive	399.95
20062	Pinnacle Recordable CD-ROM	1689.00

ACCESSORIES

5579	Adesso PowerBook Battery	$59.95
18685	BTI Type 4 Int Duo Battery	119.95
19330	Curtis Printer/Workstation Stand	49.95
1092	Kensington NoteBook Traveler Dlx	75.00
15422	Sony DG90M Cartridges (5 Pack)	50.00
6201	Tripp Lite Isobar 8 Surge Supress	59.00
2636	VST Thinpack Plus w/ Claris Org.	234.95

We Carry More Than 10,000 Products for Your Mac & PC!

CALL FOR A FREE CATALOG!

All at low discount prices!

Need Memory? Call us for the lowest prices around!

10 BASE-T WITH A TWIST!

It's the award-winning daisy-chainable solution for connecting PCs, Macs, printers, and portables to 10BASE-T Ethernet. Farallon's flexible and hassle-free, **EtherWave** lets you set up your network the way you need to—and where you need them—without worrying about adding hub ports or pulling more wire.

ONLY $109
11499

AWARD-WINNING TECHNOLOGY!

The **Canon IX4015 Color Flatbed Scanner** provides full page color in 20 seconds! This scanner offers 12 to 800 dpi, 4% to 400% scaling and has automatic background control.

15788 IX4015 Color Scanner **$719.00**

MACWORLD MW ★★★★

OUR POLICY

- VISA, MASTERCARD, AMERICAN EXPRESS, and DISCOVER cards. No surcharge.
- Most of our products are covered by manufacturer's warranty.
- We are not responsible for typographical errors.

EVERYTHING OVERNIGHT®

Continental U.S.: Shipping Charges: $3 per order; please add an additional $10 for each desktop system, scanner, printer, monitor or power backup. Or you may elect FREE UPS Ground shipping on orders which include the hardware mentioned above. Barring events beyond our control, all credit card orders phoned in weekdays by 3 a.m. ET will ship Airborne Express for delivery the next business day. (Some orders ship UPS Ground for next day delivery). Saturday delivery available to many areas upon request at no additional charge. Order all day Saturday thru noon Sunday for Monday delivery. Some areas require an extra day delivery.

APO/FPO, International orders and Hawaii, Alaska, Canada, Puerto Rico & U.S. Virgin Islands: Shipping may require additional time and charges. Please call for information.

All other areas: Please call 603-446-3333 or FAX 603-446-7791 M-F 9 a.m.-5:30 p.m. ET.

OPEN 24 HOURS A DAY!

Our order lines are open 24 hours a day, 7 days a week.

795MW

SUPER SUPRAFAX

Supra's V.34 modems offer Flash ROM for convenient firmware and feature upgrades, 28,800 bps data speeds (115,200 bps throughput), 14,400 bps fax. The **SupraFAXModem 288 V.34** external model features an easy-to-read numeric display panel, and includes *FAXcilitate*, *MicroPhone LT*, and *CompuServe* software. Features a five-year limited warranty.

ONLY $229.95
15788

© Copyright 1995 PC Connection, Inc. MacConnection is a division and registered trademark of PC Connection, Inc., Marlow, NH.

BUSINESS

13510	AEC FastTrack Schedule-Mac	$169.95
14187	BestIWare Mind Your Own Busin	79.95
16850	BestIWare MYOB w/Payroll	139.95
5863	CheckMark MultiLedger	119.95
5862	CheckMark Payroll	79.95
3903	ClarisWorks 3.0	129.95
1668	Computer Assoc Cricket Graph 3	89.95
12974	DeltaPoint DeltaGraph Pro III	139.95
11721	IdeaFisher for Mac	95.00
11269	Inspiration	129.95
18864	Intuit QuickBooks for Mac	119.95
15070	Jian Business Plan Builder	79.95
5454	Microsoft Office for Mac 4.2	479.95
16544	Microsoft Word 6.0 for Mac	299.95
2884	Microsoft Works for Mac	87.95
8010	Niles EndNote Plus	169.95
16143	Nisus Writer	279.95
16884	Nisus Writer with Language Key	334.95
18866	SoftKey BodyWorks CD-Mac	39.95
7447	SoftKey KeyCad Complete	29.95
14790	SoftKey WriteNow 4.0	44.95
16548	Symantec ACT 2.0 Upgrade	49.95
2986	Timeslips III	194.95
4711	WordPerfect 3.1 Ver. Upgrade	68.95
17237	Writeplace Writing Coach	59.95

VIDEO

16515	AITech Multipro CTV	$279.95
17314	Magnavox 14" Color Display	299.95
19342	NEC MultiSync XV15	469.95
20215	NEC MultiSync XV17	749.95
30734	Radius Prec. View 17"	999.00
14596	Radius 2 Page 20" Grayscale	869.00
2774	Radius Precision Color 8XJ	479.00
16943	Radius Spigot Power AV	799.00
20284	Radius Spigot Pro AV	1399.00
19162	Radius Thunder 24/GT	1399.00
19156	RasterOps Prism 24 Bit Video Cd	699.00

GRAPHICS

1736	Adobe Illustrator 5.5	$389.95
19251	Adobe PageMaker 5.0	549.95
19257	Adobe Photoshop 3.01	569.95
16119	Corel Gallery CD	39.95
3227	Deneba Canvas 3.5	289.95
19986	Digimation Photo/Graphic Edges	149.95
15101	Dubl-Click IconMania	29.95
18125	Elastic Reality	279.95
9034	Equilibrium deBabelizer Toolbox	259.95
16746	Extensis PageTools Extensions	99.95
16962	Fractal Design Painter 3.0	349.95
12983	Frame Tech FrameMaker 4.0	599.95
11724	Graphsoft MiniCad+ 5.0	599.95
15989	HSC Kai's Power Tools/KPT Bryce	169.95
19613	HSC KPT Convolver	129.95
20194	HSC Live Picture	699.95
19626	HSC Power Photos	129.95
19379	Macromedia Multimedia Studio	1499.95
5087	Macromedia Director 4.0	899.95
20046	Macromedia Design Studio	699.95
17341	Macromedia Fontographer 4.1	369.95
17252	Macromedia FreeHand 5.0	399.95
4761	RayDream Designer	249.95

UTILITIES

20092	Aladdin Desktop Tools	$49.95
6740	Aladdin StuffIt Deluxe	74.95
7927	CE Software QuicKeys 3.01	95.00
17537	Central Point MacTools Pro 4.0	99.95
12093	DataViz MacLink+ Translators Pro	95.00
4803	Datawatch Virex 5.5	69.95
16857	Insignia SoftWindows Mac	279.00
4433	Insignia SoftWindows Power Mac	289.00
6925	Now Utilities	84.00
5176	Symantec Anti-Virus Mac	69.95
16133	Symantec DiskDoubler Pro 1.1	75.95
6748	Symantec Norton Utilities	99.95
3955	Symantec Suitcase	64.95

HAMMER IT!

ONLY $999.95 14318

FWB's PocketHammer Drives give you the ultimate in drive performance in a compact, transportable package. Advanced shock mounting makes the PocketHammers ideal for taking your data with you. Choose from the 1GB or the super high-speed 2050 "Barracuda" 2GB drive. All PocketHammer drives include *Hard Disk ToolKit Full Edition Software.*

14318 PocketHammer 1000FMF $999.95

14319 PocketHammer 2050FMF $1749.95

FWB incorporated

EXPAND YOUR MEMORY, IMPROVE YOUR GRAPHICS!

1107	1MB 30-pin SIMM 80ns	$44.95
20892	4MB 30-pin SIMM 2 chip	149.95
7437	4MB 30-pin SIMM 8 chip	159.95
11151	4MB 72-pin SIMM 70ns	184.95

Prices may vary due to market conditions.

MacConnection®

800-800-3333 OR FAX YOUR ORDER **603-446-7791**

ORDERS BY 3 A.M. ET SHIP FOR NEXT DAY DELIVERY!

HEWLETT-PACKARD SUPPLIES

Each $29.95 3624

3624	Color Cartridge for Color DeskWriter/DeskJet (#51625A)	$29.95
6559	Black Ink Cartridge for DeskWriter/DeskJet (#51626A)	$29.95
11712	Color Upgrade Kit for DeskWriter/DeskJet (#C3067A)	$39.95

SONY

FIRST CLASS SOUND!

ONLY $64.95 15669

All Speaker Systems are specifically designed for computer use with magnetic shielding for use next to monitor.

The **SONY SR-PC30 Speaker System** has a compact desktop design that conserves desk space. It offers flexible mounting on monitor or desk.

ONLY $219.95 21067

The **SONY SRS-D4K 3-Piece 30 Watt Speaker System** combines two compact, full range stereo speakers with a single powerful subwoofer for deep bass.

GET UP TO QUAD SPEED!

Includes FREE CD-ROM ToolKit A $49.95 Value!

ONLY $299.95 21182

The **MDS Quad Speed CD-ROM Drive for Macintosh** is the most affordable quad speed drive yet! This quality drive features a 256K data buffer, 250ms average access time and 600 Kb/second data transfer rate. Plus, it includes a tray load feature and 1 year warranty.

AFFORDABLE MDS Mariow Data Systems PERFORMANCE

The New Mac OS Unveiled

by Galen Gruman **A fundamental reworking of the Mac system software is in the works—Macworld reveals how this will make the Mac even better**

It will do more. It should crash less and use less RAM. It will automate more tasks and reduce desktop clutter. "It" is the next generation of the Macintosh Operating System, a major reworking of the Mac OS. Due in mid to late 1996, this as-yet-unnamed successor to System 7.5, code-named Copland, promises to boost productivity by making the Mac OS operate more efficiently, by building automation into common tasks, by incorporating many features that Apple has previously offered only as options, and by providing greater flexibility and control over managing your work. Copland will also give the Mac a jazzier look (see the companion article, "The Mac's Jazzy New Face").

You may be expecting Copland to deliver a radically new way to interact with your computer—after all, Windows 95 will bring radical changes to PC users—but Apple is doing something more important: making the Mac OS more stable and more flexible in ways that you'll appreciate after you've used it awhile. You'll start to notice that you get fewer error messages, you'll get accustomed to starting several tasks running at the same time, and you'll expect programs to run faster. If Apple delivers as promised, the Mac OS will be not merely a much better OS for Macintosh owners, but a strong competitor to Windows 95 and OS/2 (see the sidebar, "Can Copland Compete?").

REBUILDING THE GUTS

Among the major changes that Apple has in store are a series of technologies with intimidating names: preemptive multitasking, protected memory, hardware abstraction layers, demand-paged memory, and multithreading. These technologies will let the Mac work more smoothly while executing multiple tasks simultaneously; better handle graphics, video, sound, and animation; recover more easily from crashes and driver conflicts; and get by on fewer resources than today's piggy System 7.5 uses. Copland will also eliminate some important constraints that hold back today's Mac.

Managing Resources for Reliability

Every Mac owner has been hit with the dreaded "Application Unexpectedly Quit" dialog box or, worse, sudden system lockups and crashes. The usual cause is contention over memory and CPU cycles. Under the cooperative multitasking of the current OS, the Finder and programs are supposed not to get in one another's way. (In an application's Get Info box you can set how much memory the application reserves for itself; demand for CPU cycles is invisible to users, but it's something programmers must decide when they develop applications.) In practice, programs—including OS components like PrintMonitor—often don't cooperate, stealing memory and CPU cycles from one another, and sometimes causing a lockup or crash. Copland introduces three solutions for this problem.

PAUL FRANZ-MOORE

File Edit View User Special Mail
5:30 PM
Trash
Items remaining to be deleted: 179
Stop
Items remaining to be copied: 25
Reading: Stock Options
Items remaining to be copied: 219
Writing: Note Pad
File Edit View User Special Mail
5:30 PM
New
Open
Print
Close Window
Get Info
Label
Sharing...
Duplicate
Make Alias
Put Away
Find...
Save Find
Find Original
Page Setup...
Print Window...
Copland HD
Copland HD
My Hard Disk
Mailbox
Catalogs
LaserWriter
Items remaining to be copied: 219
Writing: Note Pad
Time remaining: About 5 minutes
Applications
Documents
Trash

Preemptive Multitasking First is preemptive multitasking, in which the Mac OS automatically switches between active tasks at fixed intervals to ensure that time-sensitive operations (such as communications or file I/O) get enough time. (Today's OS relies on each application to surrender access to CPU time, file services, ports, and other system resources.) Preemption isolates each program so it can't cause trouble for others. But Copland implements preemptive multitasking only for network services, file services, and threads—miniprograms that a program or the Finder might generate to execute a task, such as a find-and-replace command or a print routine. Programs and the Finder must still share resources cooperatively for the majority of their functions. Partial preemption will make the Mac more stable and better able to handle multiple services like I/O and networking—but programs will still be able to crash each other and the Finder.

Memory Protection Copland's second fundamental change to increase reliability is memory protection, in which each application is allowed to modify only the memory assigned to it. Under the current Macintosh OS, tasks stick to their own area in memory only while on good behavior—so when one application stumbles, it can trip up data in other applications' memory and even data in the Mac OS itself.

Divide and Control Copland's third set of solutions—the programming version of divide and conquer—will prepare the Mac for the wide variety of hardware and

Help Me Along The Assistants feature that Copland adds to Apple Guide goes beyond walking users through a task and begins to help users perform tasks, such as adding a program to the Apple menu.

motherboard components it will face in the age of clones.

Copland will use isolation and active management to separate and tightly control components, making interactions predictable and safe. For example, Copland's file services (which manage creating, naming, moving, deleting, aliasing, linking, and copying files) will be separate from the rest of the OS, as will networking services and I/O services.

Under Copland, the part of the OS that manages the Finder and applications, called the microkernel, can crash without affecting a network transaction or data coming in from a scanner. You'll just restart the Finder without rebooting the Mac, and continue working.

Copland will also use a hardware abstraction layer, or HAL, to separate drivers and extensions from the microkernel, so that a havoc-wreaking extension will simply not load, and the driver for a new component used in a clone will be compatible without the OS being specifically designed for it.

But Apple's adoption of a HAL prevents developers from directly controlling hardware to fine-tune the performance of some components. With a HAL, Apple is trying to avoid the incompatibilities that put PC owners through contortions when the PC clone market exploded.

Apple engineers caution that no system will prevent all crashes—even under Copland, a buggy or damaged extension could affect several components of the Mac OS and cause a systemwide crash. The goal is to reasonably ensure system stability, a kind way to characterize the current Mac OS's instability.

Managing Resources for Efficiency

In addition to new reliability techniques, Copland will offer new capabilities intended to squeeze the most from whatever resources your Mac has available.

Demand-Paged Memory The use of RAM has gotten out of hand—with 24MB of RAM installed, you can still max out your memory running Adobe Photoshop, Microsoft Excel, or another big program under the full System 7.5 on a Power Mac. At fault is Apple's memory scheme, in which programs and the Mac OS reserve fixed, usually huge, chunks of memory to load all their features. Apple is changing the memory-allocation scheme in Copland so that programs load just what they need at the moment. When a program stops using a feature, that segment of code is *paged*, or moved, to virtual memory (a scratch space on disk), and then paged back to RAM when needed again. System 7.5's virtual memory scheme now does this with whole programs as you switch between them, but Copland will page pieces of programs, as well as pieces of the Mac OS.

Consider QuickDraw GX, which has three major functions—printing, graphics handling, and font handling—in addition to the standard QuickDraw screen display. If you install QuickDraw GX now, it takes up about 3MB in memory whether or not you use all of its capabilities. Copland will load the printing services just when you print and then page them to disk when you're done.

Apple says that this on-demand memory paging will let a user take advantage of all of Copland's services in the same amount of RAM it takes to load System 7.5 stripped of QuickDraw GX and PowerTalk; performance on the two systems would be the same. Similarly, Excel, Photoshop, PageMaker, QuarkXPress, and other big applications should run at a decent clip on 8MB and 16MB Macs, even with multiple programs running on a system stuffed full of third-party extensions and fonts. Of course, the more real RAM you have, the less paging and the better the performance.

Apple's paging scheme, where the feature in memory unused for the longest time is the first paged to disk, is not optimal for all programs—the overhead of loading and unloading occasionally used but large features might make the process slower than would leaving them in RAM and paging other features more frequently. Developers can replace Copland's paging scheme with schemes of their own, but since paging affects all programs, a scheme optimal for one program could hinder performance in others, and users may have to experiment.

Multithreading Having several tasks, or threads, operate concurrently in protected memory should make the Mac OS more efficient. Because threads can run

simultaneously and independently, you can fax and print at the same time, for example, even from the same program. This is one of the best features in OS/2 and Windows NT today.

Another example: multithreading can help QuickTime support larger windows and run faster. Today, QuickTime reads a batch of images from disk, processes instructions on how to present the images, and then sends the images to the screen. QuickTime can't always read the next batch of image data fast enough, causing a pause in the video or audio. A multithreaded QuickTime would read the next images from disk while processing the current batch. Other applications will be able to take advantage of multithreading in similar ways.

How Copland Reduces System Crashes

Today's Mac OS puts all the components—drivers, extensions, the Finder, network and other managers, and of course programs—in one big memory space. But these components can conflict over resources and cause crashes. Copland will put almost every component in its own memory space (shown below as boxes) so they can't conflict over resources. The key exceptions are programs and the Finder, which will continue to share one large memory space. Still, even if the Finder or a program crashes, the network, file, and other services should be unaffected.

Copland also uses an I/O manager to arbitrate communication (shown with arrows) between the system drivers and extensions and the OS components and programs. Today's Mac OS lets all these objects communicate directly, and these unmanaged communications can cause crashes.

Faster Core Components

Apple is also rewriting much of the Mac OS as native Power Mac code. The company has announced that its goal is to make Copland 95 percent native, although some Apple engineers privately told *Macworld* that 95 percent is probably too ambitious (see "Long Road to a Native OS," *Power Mac News*, *Macworld*, April 1995). Apple says the last parts of the OS slated for rewriting are those that handle 680X0 compatibility.

The key foci for native code under Copland are the I/O and file systems, two components of System 7.5 that work under emulation and are serious performance bottlenecks. Apple engineers say that they'll also squeeze more performance out of these areas by using better algorithms. For example, the new SCSI Manager will handle SCSI transfers in the most efficient order, instead of in the order it receives the transfer requests. Under System 7.5, if SCSI Manager first receives a request from a scanner to send 13MB of data to the Mac and then gets a request to move 1MB of data to a hard drive, System 7.5 processes the scanner operation first, even though it will take much longer than the hard drive operation. Under Copland, the Mac OS will give the shorter, or more immediately needed, task priority.

Massive Storage

Ten years ago, a 20MB hard drive awed most users with all that space, even if it did cost $1600 or $2000. Today, a 2GB drive—equal to a hundred 20MB drives—is commonplace and costs about $1000. To accommodate network services, huge numbers of files (component software schemes like OpenDoc will greatly increase how many files you have), and disk-eating multimedia files, Apple is increasing the maximum drive-partition size to 256 terabytes, or about 262 million megabytes. That should be enough to handle a few QuickTime VR movies, with space left for installation of Microsoft Office.

The number of files per drive, however, will remain limited to the number of blocks on the drive (a block can't hold more than one file) because that's an inherent limit in the Mac's hierarchical file system (HFS). Apple recognizes that HFS won't suit everyone's needs, so Copland will allow the use of other file systems, such as Sun Microsystems' file service, which can handle an unlimited number of files (of course you will need drivers, like PC Exchange for the Mac, to read disks using other file systems).

Simultaneous Action Copland can perform multiple I/O tasks—such as copying one batch of files while deleting another batch—simultaneously and independently.

ASSERTING THE MAC'S ADVANTAGES

In addition to providing a better infrastructure for the Finder and Mac applications, Copland will integrate several Apple system services into the core OS.

Display and Printing

QuickDraw GX's adoption under System 7.5 has lagged—developers can't count on most users installing the GX option because it requires so much RAM and is incompatible with many fax drivers and several common programs.

Under Copland, QuickDraw GX will be the only QuickDraw in town, so developers will have to support Apple's new imaging model. All current QuickDraw GX programs and most current non-GX programs will be compatible with Copland's QuickDraw GX, Apple says.

The recently released QuickDraw 3D is also being folded into Copland, giving developers a standard way to add 3-D capabilities to CAD, modeling, and other applications (see "The QuickDraw 3D Revolution," *News*, May 1995).

Component Software

OpenDoc, the joint Apple/IBM/Novell project to let developers create small program modules that work together on user documents, will be a standard component in Copland; it will first ship as an option by early 1996, Apple says (see "OpenDoc and OLE 2.0," November 1994). Apple is also wholeheartedly adopting Windows' approach to DLLs (dynamic linked libraries), called shared library modules on the Mac. DLLs are software components that multiple programs can use—for example, a word processor and an E-mail package could use the same spelling checker—that have proven to be a hit among Windows developers (including Claris, Apple's software subsidiary).

But Apple hopes to improve on Microsoft's implementation of DLLs with an OS component called the Code

Can Copland Compete?

Over the last year or so, Microsoft has been the focus of OS stargazers, as the software giant tantalized the computing world with talk of Windows 95 (see "The New Windows Threat," *Macworld*, February 1995). Apple stuck to its policy of remaining silent about its plans to counter Windows 95, until the Microsoft marketing juggernaut built up so much pressure that Apple had to reassure its customers and third-party developers. Thus *Macworld*'s invitation for an early look at Copland.

APPLE WILL HAVE TO PLAY CATCH-UP TO OS/2 AND WINDOWS 95

It's pretty clear why Copland will be good for the existing Mac community, but will it be strong enough to succeed, or even survive, against Windows and OS/2? Yes, thanks to some smart decisions on Apple's part and some fundamental flaws in the competition's offerings.

Mostly Multitasking

Why did Apple decide to make Copland only partially preemptively multitasking? Apple says that going to 100 percent preemptive multitasking, with its much-improved stability and much greater performance for some tasks, would require developers to produce major rewrites. Still, with 18 months remaining until Copland ships, you'd think that developers could be ready in time. But developers need more time for two reasons.

First, most major Mac developers also develop for Windows, and now that their Power Mac ports are done, the developers are too busy with Windows 95. Copland rewrites will just have to wait until Windows 95 settles down. Second, most major developers revise their products independent of Microsoft's or Apple's exigencies—developers will support major new capabilities only at the next scheduled release.

By supporting today's programs while offering some preemptive capabilities, Copland bridges the gap between System 7.5 and Gershwin (a follow-on to Copland whose multitasking will be fully preemptive).

So it makes sense for Apple to phase in preemptive multitasking. But won't Microsoft's getting preemptive multitasking to market ahead of Apple blunt Apple's ability to sell its preemptive multitasking? Perhaps not, because the final beta of Windows 95 cannot preemptively multitask 32-bit–native programs effectively. Running even one of these programs can bring Windows 95 to a crawl, according to tests by *InfoWorld* (published in its March 27, April 2, and April 24 editions). (The reason, Microsoft says, is to maintain backward compatibility with today's 16-bit Windows programs—a burden the 32-bit Mac does not bear.)

That such a serious problem exists only six months before Windows 95's ship date raises concerns about the program's fundamental stability, despite Microsoft's claims that it has a fix for the problem (*InfoWorld* also tested the fix and found it wanting). Support for 32-bit preemptive multitasking is the keystone in Microsoft's plan to make Windows able to work online, present multimedia, calculate spreadsheets, and play games all at once.

Windows 95 users will be able to get around the preemptive problem by running current programs in shared memory in a cooperatively multitasking environment (the same technique that Windows 3.1 and System 7.5 use today). But in this scenario Windows 95 will run out of conventional memory (DOS's 640K limit), as does the current Windows when too many programs are loaded, even with plenty of extended memory available. To get an idea of what this means, imagine that the Power Mac could not run native PowerPC applications and instead forced users to run only 680X0 applications in emulation, and then only a few at a time. (Microsoft says Windows 95 isn't based on DOS, but developers say otherwise.)

As for OS/2 and Windows NT, their preemptive multitasking runs fine now, showing that this OS approach can work. Fortunately for Apple, OS/2 is difficult to install and use, *and* Windows NT runs standard Windows programs slowly.

In any case, multitasking desktop systems may never become as bulletproof as minicomputers and mainframes. Even with protected memory, desktop systems share so many resources—for example, when two applications overlap windows on a monitor or share a mouse—that the applications must be aware of each other.

Driver Education

What about drivers? The new HAL architecture will require many vendors to rewrite their drivers and other extensions. But drivers are relatively easy to update, and the HAL architecture, in addition to providing greater stability by isolating drivers from everything else, gives

hardware designers a compelling reason to rewrite their drivers: clone support. As clone makers begin designing motherboards using components Apple never anticipated, and as the future Apple/IBM converged platform is adopted by companies that use their own components, writing for the HAL neatly skirts the risk of incompatibilities with new Macs: both clones and Apple's.

For example, a clone may not use the same floppy drive in its Macs as Apple or Radius. Under System 7.5, an application might expect to encounter an Apple floppy drive; if instead it finds a different drive—even with the right driver software installed—that application could lock up. Under Copland, the program will communicate with the Mac OS's I/O services, as will the device driver; in effect, the OS, through the HAL, will mediate interactions between strangers. The HAL will also ensure the Mac's compatibility with a variety of new technologies that Apple has been adopting, such as IDE and PCI.

Windows NT and OS/2 users suffer from driver problems. In both cases, when poor programming is not to blame, driver problems are usually caused by hardware dependencies left over from their DOS and Windows roots, that Apple's HAL aims to avoid.

Common OS Services

In the past, Apple undercut adoption of some of its own technologies by making them optional. Developers typically avoid proprietary technologies, particularly optional ones and especially if those developers also market Windows versions of their software. With Copland, Apple is taking a push-me/pull-you approach. By turning previously exotic components into core elements in its base operating system, Apple will compel more developers to support technology they might otherwise not bother with—developers that play along can rest assured that their customers will be able to take advantage of all Apple-provided technology their products use.

Still, Apple is taking a big risk with this approach. Will enforced support of QuickDraw GX, PowerTalk, and other OS services deter developers from supporting the Mac? Will cross-platform developers then force Apple to produce Windows versions of these crown jewels? Or will developers be willing to exploit Apple's key capabilities in just the Mac versions of their products?

Microsoft and IBM are pushing similar technologies in Windows 95 and OS/2, so Apple must compete not just on features but also on how well the features work and how well they are perceived. This is where Apple is weakest: previously the company has arrogantly assumed that people would pay extra for pieces of the OS (people wouldn't—remember System 7 Pro?). But Apple is now doing the right thing, taking some of the steam out of Windows and OS/2 by offering some advanced features for the Mac now, giving developers and users time to get familiar with them before they become standard components.

The Mac has advantages in a few key areas that could become de facto standards if Apple makes them cross-platform: QuickTime is better than Video for Windows; Apple Remote Access is better than Windows Remote Access; and OpenDoc, when it ships, will be better than OLE. Apple understands this advantage and is working now on making all three features cross-platform.

By the same token, some Apple technologies—QuickDraw 3D, QuickDraw GX, and WorldScript—are key differentiators. If you want those capabilities you have to buy a Mac. To get that message across, Apple will need to strongly encourage (read: fund) developers producing products that make good use of these technologies. Apple may have to design some products itself and market them through AppleSoft or Claris. Microsoft hasn't hesitated to develop software that exploits the strengths of its own operating systems. Neither should Apple.

Copland's New Neighborhood

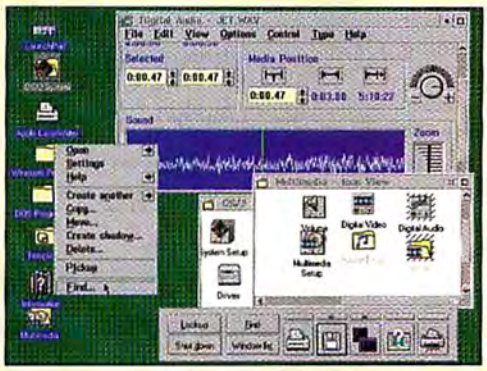
Assuming that Windows 95 is reasonably stable when it ships, how will Copland compare with it, Windows NT, and OS/2?

OS/2 and Windows NT will continue to suffer from being niche products. IBM may not be able to change OS/2's niche status—the company should just accept that OS/2 is not a desktop OS for the masses and instead focus on marketing it correctly. Windows NT will suffer because it will be the "old" Windows and because there are not many NT-native programs. But Microsoft promises the Windows 95 interface for NT next year, and urges developers to ensure that native Windows 95 programs also run on NT. That's smart, but it could cannibalize the existing Windows customer base, as people start moving from Intel-based systems to PowerPC-based systems.

Even if Apple and IBM can break Intel's dominance in the CPU market, Apple will still face the OS challenge on the PowerPC front. That's why Copland is so critical for Apple: Copland, if successful, will give the Mac a productivity advantage at the OS level that will keep the Mac competitive with Windows machines using the same inexpensive hardware platform that Apple does (see "Mac Hybrids," April 1995).

That leaves Windows 95 and Copland battling for the hearts and minds of the desktop users. When Copland ships, Apple won't convert Windows users into Macintosh users, or even convince a greater percentage of newcomers that the Mac is better. After all, the Mac was easier to use until at least 1992 when Windows 3.1 shipped, and that didn't matter much with consumers. Copland's ease-of-use features will be easy for Microsoft or third-party developers to duplicate in Windows 95.

To do more than hold its own, Apple must get programs to market with compelling benefits that Windows 95 just can't offer. In a surprisingly candid comment, one Apple product manager admitted that Macintosh probably won't displace Windows as the business standard in the United States, but he said that Apple is gaining faster than Windows in the overseas market, which is only now beginning to see the adoption rate that occurred here in the mid to late 1980s. He also asserted that Apple is confident it will maintain and perhaps widen its lead in the areas where tomorrow's buyers set their expectations: the lucrative publishing and multimedia markets, the fast-growing home market, and the education market.



Razzle-Dazzle Both Windows 95 (left) and OS/2 (right) now offer slick, hip features such as Internet and multimedia support. They also offer some more useful features, such as context-sensitive pop-up menus, sophisticated find facilities, rich help systems, and automated tasks (in Windows 95 only).

Fragment Manager, which makes sure that applications use only the latest installed version of a DLL. (Running multiple versions of a DLL under Windows can cause confusion about which version to use and can lead to system crashes.) The Code Fragment Manager also bars programs from using a DLL's memory, preventing conflicts among multiple programs using the same DLL.

Active Assistance

Apple Guide is being enhanced with more do-it-for-me features and ways to automate tasks without programming AppleScript. For example, delegation is a form of active assistance in which users answer questions about a task they want to automate, and the Mac creates the script and handles its future execution (see the screen shots in "Help Me Along" and "Take Care of It for Me" for examples). The new Task Manager will keep you informed of the status of delegated tasks.

Networking and Online Services

The new Open Transport networking service, scheduled to ship with the first PCI Power Macs in early summer, will replace today's AppleTalk-centric networking services by including a wider variety of network protocols, including AppleTalk, Novell IPX, and TCP/IP. Open Transport will also handle interactions between programs and the network protocol, so developers won't have to support every protocol and users won't have to worry about installing the right one (see "Open Transport Moves Along," *Networks* news, March 1995).

With multithreading, Apple expects Open Transport to support multiple network protocols and connections simultaneously. Thus, you could simultaneously synchronize your desktop Mac and your PowerBook through an infrared connection, get data from a NetWare server using IPX while checking your E-mail via AppleTalk on the same Ethernet network, and update a colleague's database via an Apple Remote Access session.

Take Care of It for Me Another form of Assistant is essentially an automated, recurring script, such as for a regularly scheduled system backup, that you create by answering a series of questions.

PowerTalk's collaboration services will be enhanced to provide a full set of E-mail features, such as return receipt, unsend, folders, and who's-read-this. One PowerTalk mission is to integrate all sorts of mail—internal E-mail, faxes, mail from the Internet and online services, and even voice mail—in just one in-box. Other PowerTalk capabilities include simplified server connections and digital signatures to authenticate electronic documents.

Apple will provide Internet access services, perhaps comparable to what Windows 95 will have and what OS/2 has now. Apple hints that Internet support will ship this fall as a System 7.5 add-on.

Copland will also include the Telephone Manager and a telephony interface to support voice mail and software-based fax modems.

However, Apple product managers signaled a shift away from a once-critical goal of having full NetWare server and client services on the Mac. Now, Apple is committed only to the Mac being a "first-class" NetWare client, an undefined goal.

Other Services

Other System 7.5 options that become core OS components in Copland include AppleScript for scripting, PC Exchange and Macintosh Easy Open for foreign-file access, WorldScript for multilingual support, and ColorSync for color matching.

LIFE AFTER COPLAND

Copland will ship first for Power Macs, and Apple has not decided whether to port Copland to 680X0 Macs. With most of Copland's major services—OpenDoc, Open Transport, QuickDraw GX, WorldScript, QuickDraw 3D, and so on—now available or soon to be available for 680X0 Macs, Apple may not have a strong reason to do much more for 680X0 Macs when Copland ships.

Apple's last 680X0 desktop Mac is probably the Performa 580, and there may be a 68040-based PowerBook this fall, which would be the last of its breed. The sooner Apple stops shipping 680X0 Macs, the less incentive it has to port Copland, of course, and in any case it's not clear that a 68040-based system could run Copland effectively.

Apple is also dropping the Mac ROM, so clone developers (and Apple) can save some expense. Like PCs, the Mac will have a completely disk-based OS.

THE LAST WORD

Copland will not be the last Mac OS—Apple already has a small team working on its successor, Gershwin. Reinventing the plumbing isn't sexy, but it will give the Mac OS what it needs to be viable and forward-thinking in the years to come. Later this year, Apple will be competing against other PowerPC-based systems—its battle won't be just against Intel-based PCs running Windows. Windows NT for PowerPC is due by July, and OS/2 for PowerPC may ship this fall. With 18 months or so until Copland ships, there's still a lot of development work to do, and it's possible the early Copland prototypes that *Macworld* saw won't fulfill Apple's performance and functionality goals.

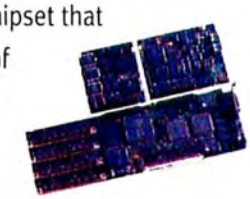
Still, where Copland is heading is impressive, and if Apple can get the Mac OS there, the Mac should enjoy a lasting, fundamental competitive advantage for multimedia, home, international, and publishing use. Here's hoping! m

Macworld executive editor GALEN GRUMAN covers operating-system design and other emerging technologies.

Take Video Anywhere Your Imagination Can Go

TARGA®2000

Set your imagination free with the TARGA 2000 video authoring solution for Macintosh™. TARGA 2000 from Truevision gives you high-quality video capture and playback, CD-quality audio, and extraordinary performance – all at an affordable price. ▪ At the heart of the system is a powerful video processing chipset that is the result of Truevision's ten years of leadership in desktop digital video. ▪ That means no-compromise, full-screen, full-motion, 60-fields, 30-frames per second video recording and playback. Giving you high-quality footage right from your desktop computer. And you can view your work on two displays simultaneously. Your video sounds great, too, because with TARGA 2000 you can capture and manipulate 16-bit, CD/DAT-quality stereo audio. Plus our upgrade path allows your system to grow with your needs. ▪ TARGA 2000 is also compatible with any QuickTime™ 2.0 video editing, effects, and production software you'll want to run. And for a limited time, TARGA 2000 comes with Adobe Premiere™ 4.0 with accelerated TARGA transitions – free of charge. ▪ Choose TARGA 2000 and create video as powerful as your imagination.



TRUEVISION®
First in Digital Video

2500 Walsh Avenue, Santa Clara CA 95051
Phone:1-800-SAY-COLOR or (317)-841-0332
Fax:(317) 576-7700

Circle 124 on reader service card

The Mac's Jazzy

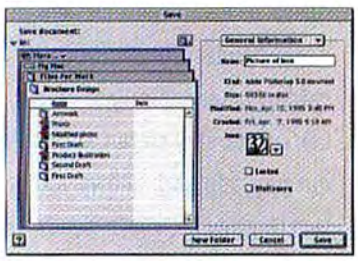
The new Copland interface

Although Copland's release is still about 18 months away, Apple has revealed part of the next Mac OS's new look. While some details are still under development, the images here show the elements that Apple is confident will survive mostly intact in the final version.

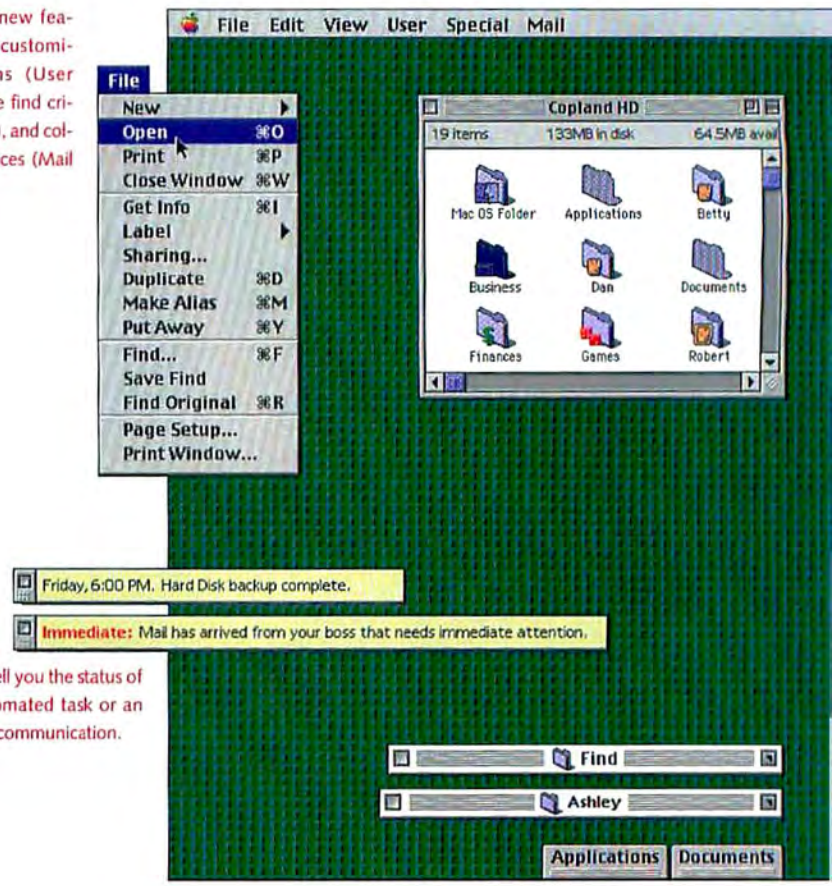
focuses on personalization, appealing style, and

Windows are now easier to move. You just grab onto any side and drag.

Menus reflect new features, such as customization options (User menu), reusable find criteria (File menu), and collaboration services (Mail menu).

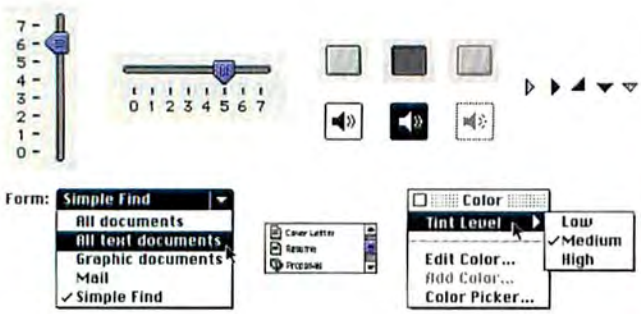


New Open and Save dialog boxes add preview and information palettes. Developers can also plug in their own palettes—for example, Microsoft could display Word's Summary Info in the Open or Save dialog boxes. The new dialog boxes also provide a more obvious representation of folder hierarchies and add a button to give quick access to favorite folders.



Alerts tell you the status of an automated task or an urgent communication.

Drawers help reduce desktop clutter. You can now activate the WindowShade feature (another clutter reducer) with a single click on a window.



Standardized interface elements should ensure greater consistency across applications. Most of these elements have evolved piecemeal; Apple is finally providing them ready-made for developers. Elements include vertical and horizontal sliders, buttons and triangles, pop-up menus, scrolling lists, and tear-off menus.

New Face

usability, not on change for its own sake

BY GALEN GRUMAN

Windows is getting its third major face-lift in six years. OS/2 has been prettied up to appeal to the average PC owner. Even Unix interfaces are looking rather slick these days. And the Macintosh Operating System? Its look and feel hasn't changed significantly since Apple added color in 1987. With Copland, the next-generation Mac OS that's scheduled for release in 1996, will Apple make sweeping changes to its interface in response?

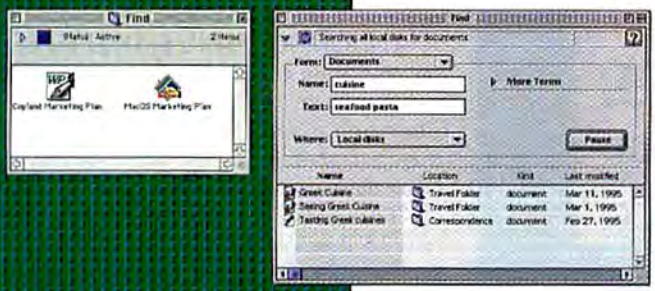
No.

Apple's interface has stood the test of time—the company sees no reason to start over. And my recent survey of top interface researchers in the PC and Mac communities shows that, indeed, there is no interface revolution brewing somewhere just waiting to be exploited—nothing equivalent to the work at Xerox in the early 1980s that provided Apple with a fundamentally new alternative to the command-line interface.

Even the major interface changes Microsoft is planning for Windows 95 are primarily meant to make room for built-in system services such as remote access (similar to changes that Apple has been making for a couple of years), to reorganize elements of the interface, and to streamline user operations. All of these changes are important, but none of them are fundamentally different from the now-familiar graphical interface and desktop metaphor.

So while Apple has decided to jazz up the Macintosh interface to make it more fun and to add more system services, its real effort in Copland focuses on making underlying changes to the Mac OS that should result in better functionality, rather than just a new look (see "The New Mac OS Unveiled," in this issue).

Three-dimensional icons and attributes are used throughout.



The enhanced Find feature will let you save search routines that constantly update their contents. That would let you create searches on the Internet or on a server to find, for example, the latest shareware or financial reports. Apple is also adding the ability to search for text inside files.

The Task Manager provides quick access to all the automated tasks you've assigned Apple Guide to take care of.

Keeping Up with the Times

But don't dismiss the new look. While it refines the Mac look you already know and love, it also signals Apple's intention to stay apace of today's styles. The new buttons and bars have 3-D shading, icons and folders appear in 3-D perspective, and the overall look is a bit more high-tech; sometimes it's a little too much like the changes Microsoft is making in Windows 95. (You can download some of these icons, for use in your current system, from Macworld Online, available on America Online and eWorld.)

More Standardization Some of Copland's interface changes are subtle but important. For example, it standardizes many interface elements—tear-off palettes, radio buttons, slider controls, and the triangles that reveal and hide submenus or subfolders in hierarchies—that third-party developers have been creating in ad hoc fashion for years.

Enhanced Capabilities Several modernizing look-and-feel changes also add significant new features. For example, to drag a Copland window you can grab onto any edge, not just the title bar. Some dialog boxes have new features, too: the Open and Save functions can show file previews and provide an optional space for other information. While these sorts of elements have been available as third-party utilities for years, they will now be standard features—at no extra cost.

To take advantage of some of these features, developers will have to rewrite their programs. But other features will appear automatically in programs that use System 7's built-in equivalents. For example, any program using System 7's standard windows and dialog boxes will automatically use the new ones when running under Copland.

Improving the User Experience

Other changes affect not just the look, but also how you interact with the Mac.

Less Clutter Consider Apple's variant on an old Windows trick called Minimize, which reduces a window to an icon at the bottom of the screen, where it is easy to access but out of the way. In Copland, if you drag a folder to the bottom of the desktop, it becomes a drawer, which reduces its size on screen much as System 7.5's WindowShade utility now does. WindowShade remains in Copland, and a new icon in the upper-right corner of the folder window collapses a folder with one click. Drawers are a handy place for elements that you use frequently but don't want cluttering up your desktop (you probably have folders along one side of your desktop now to achieve this goal). WindowShade, on the other hand, temporarily reduces the space taken up by windows you leave open. Neither approach feels more or less natural to me than Windows' Minimize approach.

Simpler File Movement A simple change, but a real time-saver, is the auto-open folders feature: As you hold a file or folder icon over a folder, the folder opens, which simplifies moving an item into a folder that is buried several levels deep. And when you let go of the mouse button to drop the item into the destination folder, all the folders you opened along the way close.

The Interface You Want

Beyond the new embellishments and operational refinements, Apple has adopted an approach that has been gaining popularity in other platforms, including OS/2 and Windows: personalized interface styles.

Custom Look and Feel With personalized styles, the Mac won't work differently, but you will be able to make your Mac reflect the personality you want to convey. These styles will affect the way windows look, the fonts in menus and dialog boxes, the sounds that play when you perform certain actions (such as opening a folder), the desktop pattern, and even animations that accompany actions. The interface style can be as crass, staid, or energetic as you want. Edmark's KidDesk program and even Apple's At Ease interface shell offer a more primitive version of this idea today.

Apple will package a variety of personalized interface styles with Copland, and it expects other companies to sell style collections. It's even possible for a company to develop an interface editor that would let you create your own look, although that capability will not be built into Copland.

A Mac for All Tastes Copland will let you make radical changes to the look and feel of your desktop by selecting a personalized interface style, much as you can now change the desktop pattern or select a screen saver. Apple and other companies will provide collections of styles that determine not just the look of the interface, but also the animations and sounds associated with actions.

One Mac, Many Users Copland will also offer another type of customization, which Apple calls a scalable interface. It will let you remove different items (such as the Trash) and menu options (such as Sharing) so you can set up individual environments for different people. Each user will choose his or her own work environment and enter a password.

You can use this to reduce the clutter of never-used items—do you really need all those control panels?—or to prevent your children from throwing away your files (you would just create an environment for them with no Trash Can). For Macs shared by different people—at the office, perhaps, or at home—this is great. And if you move from Mac to Mac you can take your environment with you on a floppy disk. Each environment can have its own personal interface style. But Apple will not provide encryption or real security for work environments—a major weakness in the implementation, one that underscores Apple's focus on multiple users sharing a Mac at home or a user switching between notebook and desktop Macs, rather than on multiuser business environments.

The Last Word

Don't be surprised if the final Copland interface—due about 18 months from now—has other embellishments and operational changes. Apple is nowhere near being done with Copland, although the company is confident that what it has so far revealed will survive mostly unchanged in the final version.

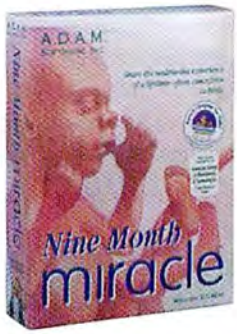
Whatever Copland's final features, the transition to the new OS should be comfortable for the Mac community. The adaptation of today's look will reinforce the message that the Mac interface may be an old-timer, but it is not aged.

There are other advances over System 7.5 that I'd like to see in Copland, such as the context-sensitive pop-up menus offered in OS/2 and Windows 95. Maybe I won't be disappointed. But no interface will satisfy everyone, since we all like different things. That's what drives the market for screen savers, icon editors, and other personalization tools. On the whole, Apple's decision to stick to the tried and true, enhancing instead of replacing what Mac owners have long loved, is the right thing to do. **m**

Macworld executive editor GALEN GRUMAN covers interface issues and other emerging technologies.

NEW!

Nine Month Miracle takes you from conception to birth and everywhere in between.



Imagine a spectacular journey inside the body as you witness the development of a new life. A faint heartbeat. The wide eyes. The tiny fingers and toes. A kick. Then, the first breath. Conception to birth, and everywhere in between.

A learning tool for the entire family, Nine Month Miracle is the multimedia experience of a lifetime! Unlock the mysteries of twins. Watch the amazing changes as the baby's face develops. Share the real-life joys and concerns of expectant parents, captured on video. Get the latest information from experts at the American College of Obstetricians & Gynecologists. And much more.

Developed by

A.D.A.M.® SOFTWARE, INC.

Bringing Multimedia To Life

Available on CD-ROM for Macintosh® and Windows™

Order Nine Month Miracle now for only $39.95

($30.00 off suggested retail price).

1-800-408-2326

Dept. #530

©1995 A.D.A.M. Software, Inc. All rights reserved.

Circle 22 on reader service card

No matter how fast can't outrun a power

New Back-UPS™: reliable power for your Mac

Just don't have the time for power problems on your Mac? Don't worry. They'll always make the time for you. It's not if a power problem will occur, but when. Due to household appliances, poor wiring, bad weather or even other office equipment, power problems are as inevitable as death and taxes. You can't run, but you can hide, behind APC protection.

IN THE NEXT THREE MONTHS, MORE THAN 30,000,000 PCs WILL BE HIT BY POWER PROBLEMS...

Who needs power protection? If you use a computer, you do. A study in a recent *PCWeek* showed that the largest single cause of data loss is bad power, accounting for almost as much data loss as all other causes combined. Every Mac plugged into an outlet is vulnerable. In fact, you have better odds of winning the lottery than of escaping the sting of power problems. One study found a typical computer is hit 100 times a month, causing keyboard lockups, drive damage, or worse.

Simply put, if power problems are the least of your troubles, you've got one chance to keep it that way. You insure your car and home with the best policy you can afford. It just doesn't make sense to leave your Mac (which is at far greater risk) vulnerable to loss or damage.

Source: Contingency Planning

Source: Bell Laboratories

Power problems are the leading cause of computer data loss, while the most frequent type of power problems are undervoltages and blackouts, which surge suppressors alone are powerless to protect against.

WHY A $119 APC UPS COSTS LESS THAN A $9.99 "SURGE PROTECTOR"...

Contrary to most people's belief, a Mac alone has more protection built into it than a low-end "surge suppressor," which is usually nothing more than a well-packaged extension cord. In other words, going without protection is as good as under-spending on one of the most important computer decisions you'll make.

And since sags and blackouts represent more than 90% of power problems likely to hit your Mac, even quality, high-performance surge suppressors are literally powerless to protect your Mac from data loss.

That's why you need instantaneous battery backup power from an APC Uninterruptible Power Supply to prevent keyboard lockups, data loss, and crashes. With an APC UPS, you get six times the protection of a high-end surge protector for little more than twice the price. And $119 is much less expensive than false piece of mind.

APC UPSs carry up to a $25,000 lifetime guarantee against surge damage to your properly connected equipment,

and can suit any application, from servers and PCs, to fax and satellite systems.

More than 3,000,000 satisfied customers count on APC reliability

Modern Press President Stephen Hopkins explains, "I protect my Mac Performa with a Back-UPS 400 and the unit works great. The Mac handles all bookkeeping, administrative and estimating functions for the company. It is a critical piece of my business. Unfortunately, we are located in an industrial park... a nice way of saying that our power fluctuates a great deal. After five years of reliable performance from my Back-UPS, power problems are no longer my concern. I can focus my energy on my business instead."

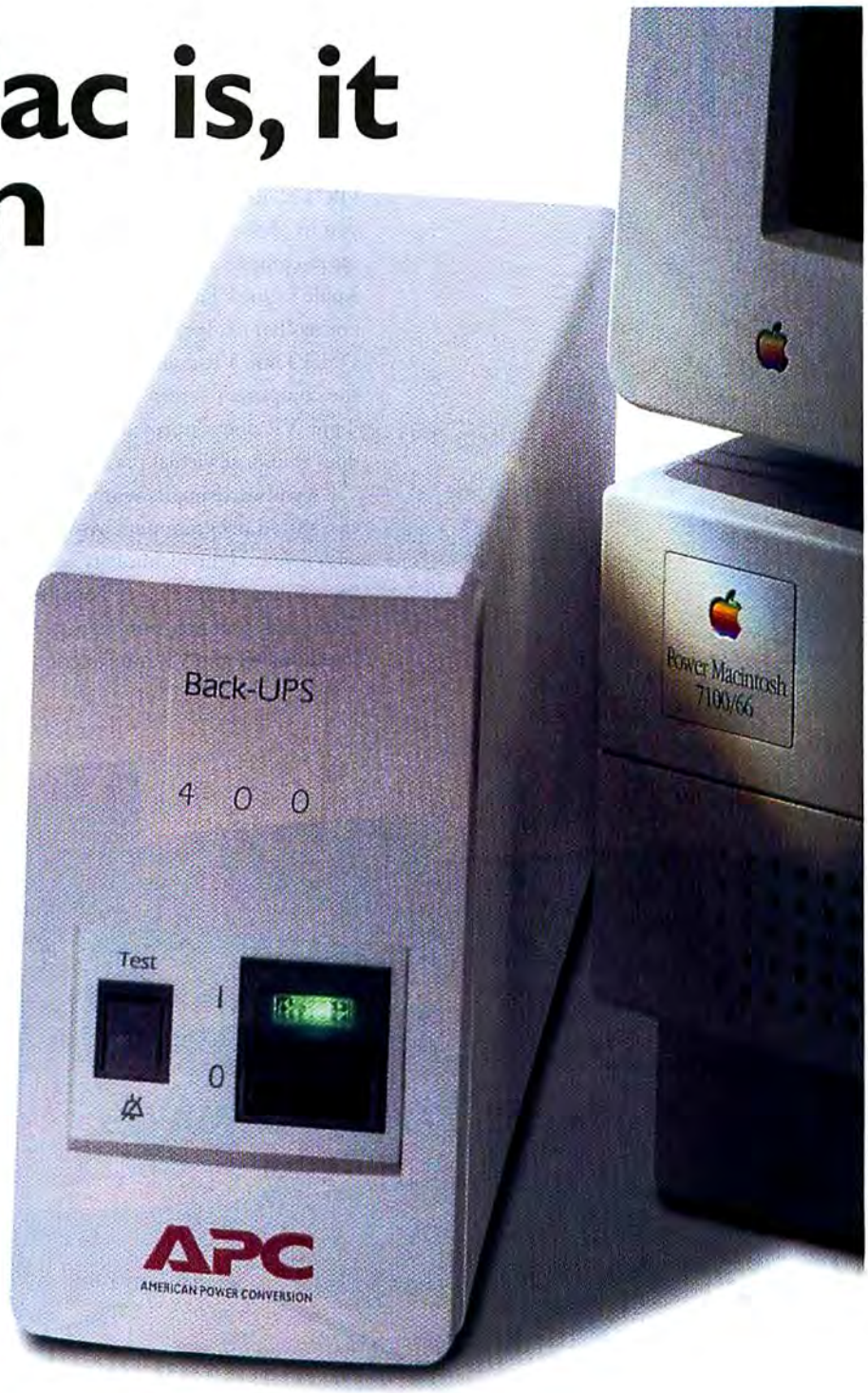
At Cellophane Square, Seattle's best known independent and alternative rock record store, Steve Marcus, Product Buyer, counts on APC to keep his Mac II SI and POS terminals running reliably. "The building where we started out was ancient and full of power problems. I lost lots of purchasing and product related information... until we invested in APC. I chose APC because they offer the most reliable product. I haven't been proven wrong yet. Problems continued in the building, but they were no longer a problem for us."

"We have over 30 APC units on our Macs," says Tim Girvin, principal of Tim Girvin Design, Seattle, WA. "Why do we protect every computer in the firm with an APC? As design consultants working on projects throughout the United States and Asia, 100% productivity is critical to project management. We cannot afford lost files due to power outages because of the complexity of many of the design programs we manage. Lost projects due to unprotected files is simply irresponsible. With APC in place, power problems are not even an issue, we are protected."

© 1993 APC. Back-UPS and PowerChute are trademarks of APC. Other trademarks are property of their owners. Specs subject to change without notice.

your Mac is, it problem

starting at $119



PROTECT YOURSELF OR KICK YOURSELF...

It's been said that there are two types of computer users: those who have lost data, and those who are about to. Prevent the single largest cause of computer problems and join a fast-growing third category: those who protect their PCs with the most reliable protection they can buy: APC UPSs. So ask for APC at your favorite reseller. At just $119, an APC UPS is serious protection no Mac user should be without.

MacWEEK *"Ultimately, it's more a question of when - and not if - you should buy a UPS... UPS power protection has never been cheaper or more convenient"*

MacUser *"A UPS can pay for itself the first time it saves your data..."*

Back-UPS FEATURES

- Unmatched surge/lightning protection for maximum hardware safety
- Site diagnostics automatically spot missing ground and reversed polarity
- LAN signaling allows simple shutdown with interface kits (400 and above)
- User replaceable, hot swappable batteries insure uptime safe disposal. Battery lasts 3-6 years under normal use.
- $25,000 lifetime Equipment Protection
- 10 minute runtime with specified applications. For longer runtimes choose next largest unit.

	Model	Application	Sugg. List
NEW!	200	Desktop systems	$119
NEW!	280	Desktop systems	$139
	400	MultiMedia	$199
	450	Quadra	$254
	600	PowerMacs	$359
	900	Longer runtime applications	$529
	1250	Multiple systems	$689

"★★★★...should be standard on every desktop... effective, affordable, designed to last..." --PC Computing

APC products have won more awards for reliability than all other UPS vendors combined.

APC™

AMERICAN POWER CONVERSION

Call 800-800-4APC

Dept. D7

132 Fairgrounds Rd. W. Kingston, RI 02893 Tel: (401)789-5735 Fax: (401)789-3710 Compuserve: GO APCSUPPORT Internet: apctech@apcc.com

France: (+33)1.64.62.59.00 Germany: (+49)89 958 23-5 UK: (+44) 753 511022 Ireland: (+35)391 702000 Latin America: (+1)401.789.5735 Japan: (+83)5295 1988

Circle 72 on reader service card

VR: QUICKTIME'S

VIRTUAL REALITY—THE GOGGLES-AND-GLOVES TECHNOLOGY THAT IMMERSES you in photo-realistic three-dimensional worlds that you can explore—requires more computing horsepower and hardware than a personal computer provides. Apple's QuickTime VR technology brings the best parts of virtual reality—user-controlled exploration and examination—to Macs and Windows computers. QuickTime VR doesn't demand goggles or gloves; you view a virtual world on the computer's screen and move around using your mouse or keyboard. QuickTime VR doesn't provide the total immersion of true virtual reality, but neither does it impose virtual reality's hardware requirements. Think of it as virtual VR.

A software supplement to QuickTime 2.0, QuickTime VR is the brainchild of two gifted programmers in Apple's Advanced Technology Group: Eric Chen, who invented the technology back in 1991, and Ian Small, who's been responsible for refining it for release. Together with QuickTime VR senior content engineer Ted Casey and program manager Eric Zarakov, Chen and Small gave me a day-long QuickTime VR introduction.

Apple's QuickTime VR brings the best of virtual reality to personal computers

NEW EDGE

by Jim Heid

MARK JOHANN

STAR TREK: YOU ARE THERE

The QuickTime VR Experience

Initially, QuickTime VR will find its way into multimedia CD-ROM titles, where it will join images, sounds, text, and conventional QuickTime movies. QuickTime VR adds a unique benefit: the ability to explore scenes and objects for yourself. A developer who uses QuickTime VR creates a virtual world that you can control instead of simply observe.

A conventional QuickTime movie is viewed from a single perspective. You can watch it from start to finish or skip around within it, but your view of the subject—say, an orchestra on a stage—was cast in stone when the original video was shot.

With a VR movie, you can change your view by clicking and dragging within the movie or by using the keyboard's left- and right-arrow keys. For example, dragging to the left causes the view to change as if you were turning your head to the left, while dragging up is the equivalent of looking up (see "Star Trek: You Are There"). Not only can you see the orchestra, but you can also turn around to see who's sitting in the row behind you. You can zoom in on the orchestra for a closer look, or zoom out to see the big picture. Apple calls a VR movie that provides this freedom of navigation a *panoramic* movie.

When creating a panoramic movie, a developer uses Apple's QuickTime VR authoring software to create a 360-degree image; it's this image that you navigate. Because the panoramic movie is actually a single still image, it can't contain motion—you can see the orchestra and audience, but you can't see the conductor's blurring baton or the latecomers scurrying to their seats. This is QuickTime VR's biggest disadvantage compared with goggles-and-gloves virtual reality.

QuickTime VR movies can also contain hot spots—areas on which you can click to perform an action, such as display some text, play a sound, or most commonly, switch to a different VR movie. Our VR movie of the concert hall might have a hot spot below the exit sign—click on it to move to the lobby.

There's a key difference between QuickTime VR hot spots and the hot spots in non-VR CD-ROM titles: a QuickTime VR hot spot is embedded in the movie itself, and moves along with its object as you move around in the panoramic. In non-VR CD-ROM titles, hot spots are just static points on the screen; they aren't part of QuickTime movies.

Clicking on a VR hot spot might also allow you to examine a specific object from different angles by clicking and dragging—it's the QuickTime VR equivalent to picking up an object and turning it around. This kind of exploration is provided by a different type of QuickTime VR movie, the *object* movie.

Fortunately, as with linear QuickTime movies, QuickTime VR movies' consumer hardware requirements are modest. Apple recommends a 25MHz 68030 or faster Mac with 5MB of memory, or a 33MHz 386 Windows machine with 8MB of memory. And QuickTime VR movies themselves are remarkably compact—one panoramic movie uses only about 800K of disk space.

Unfortunately, QuickTime VR movies are expensive and complex to create. Apple's QuickTime VR authoring tools, the only software available for making VR movies, cost $2000 and are difficult to use. ("You've got to be a wirehead to get this stuff to work," one QuickTime VR developer told me.) They also require a fast Mac with 40MB of memory. The authoring landscape may change over time, but initially, most of us will be QuickTime VR consumers, not producers.

Here's a look at the process and the technology that developers use (see the diagram, "How Apple Makes QuickTime VR Feel Real," for other details on creating QuickTime VR movies).

From Pictures to Panorama

If you're a shutterbug, you've probably experimented with panoramic pictures: snap a picture, turn, snap another, and so on, until you've photographed a vista too grand for a single picture. Then you arrange the photos on a tabletop, aligning them where they overlap.

The first steps in creating a QuickTime VR panoramic movie are similar. Mount a camera on a tripod, orienting it vertically to capture as much of the subject's height as possible. To avoid distortion, the camera must be level and aligned so that it rotates around its optical center. Because a camera's tripod mount is on the camera body and not on the lens, a tripod-mounted camera will not rotate around its optical center unless you offset the camera slightly. Creating this offset today means using a heavy-duty tripod and an array of brackets and tripod heads containing levels (see "Photographing for QuickTime VR"). Apple is working with third-party developers to create simple low-cost brackets that would enable the use of lightweight tripods.

The number of pictures required for a full panorama depends on the camera and lens. Apple recommends using a 35mm camera with a 15mm lens. (A fisheye lens won't work.) Apple also recommends that each image have 25 to 40 percent overlap with the adjacent images. That's more overlap than you'd use for tabletop panoramics, but it leads to a better panoramic movie.

You can also take 360-degree images

QuickTime VR lets you explore locations using the mouse or the keyboard's arrow keys. The scenes shown here are from the first CD-ROM to use QuickTime VR, Simon & Schuster Interactive's Star Trek: The Next Generation Interactive Technical Manual.

Left: We're on the bridge of the USS *Enterprise*. We can look left and right or zoom in and out if we want, but in this screen, we're about to jump to a different bridge location—the helm station. (The arrow pointer means the mouse is over a hot spot that leads to a different location.) **Middle:** We've arrived at the helm station and we're in the process of turning to the right, as indicated by the right-pointing arrow. **Right:** We've turned almost 180 degrees to look at where we came from. The mouse is over the hot spot that, if clicked, will return us to our original location. (For information on this $69.95 CD, call 212/698-7000.)

using panoramic cameras, which contain motorized mechanisms and special shutters for capturing a 360-degree image in one fell swoop. One drawback, however, is that panoramic cameras are expensive, ranging in price from $1000 to over $15,000. Another drawback is that the resulting image is likely to have areas that are poorly exposed—for example, in a panoramic of a sunrise scene, the area opposite the sun will be too dark. By comparison, if you take individual photos and adjust the exposure for each, the QuickTime VR software can blend adjacent images to provide a smooth dynamic range across the panorama.

You'll snap a dozen or so photos to capture a 360-degree scene. Your next job is to get them into digital form by scanning them or having them transferred to Kodak Photo CDs. Many QuickTime VR developers prefer the Photo CD approach—Photo CD scanners yield better images than most desktop scanners, the Photo CD supplier does the grunt work behind scanning the images, and the discs are an ideal archiving medium.

The previous descriptions assume you're working with photographs, but you can also create a VR movie from a series of images generated by a 3-D rendering program—a prospect likely to lead to a new generation of Myst-like adventure titles.

Stitching Time

The job of combining individual images into a 360-degree panorama falls to a program called the Stitcher, part of the QuickTime VR authoring kit. The Stitcher is the most important component of QuickTime VR—without it, creating a photographic QuickTime VR movie would require one of those expensive and inflexible panoramic cameras.

The Stitcher combines multiple images into a single file. That's the simple description. The Stitcher performs what computer graphics gurus call *environmapping*—mapping, or projecting, an environment (such as a concert hall) onto the inside of a shape, such as a cube or sphere. In QuickTime VR's case the shape is a cylinder. When you navigate a QuickTime VR movie, you are in essence moving within a vertically oriented tube whose inner walls contain the panoramic image. The Stitcher distorts the original images—which were intended to appear on a flat surface—then combines them into a seamless panoramic image.

The Stitcher usually performs its magic automatically by comparing the pixels in each image to locate the points where they overlap. If the images don't overlap neatly—perhaps one was scanned crookedly or the tripod moved during the photo session—you can use a manual-stitching mode, which lets you use the keyboard's arrow keys and number pad to move and resize images. But according to Apple, 80 to 90 percent of properly photographed panoramics can be stitched automatically. On a Power Mac 8100, automatic stitching takes about 5 minutes; on a Quadra 900, it takes about 40. Exact stitching times depend on the resolution and quantity of the images.

As it combines images, the Stitcher blends the intensity levels of each one to compensate for differences in lighting or exposure. The more the images overlap, the smoother the blends.

Painting Hot Spots

The Stitcher's end product is a PICT file containing the complete panoramic. When opened in an imaging program such as Adobe Photoshop, the PICT file appears warped and distorted. But the scene is clearly recognizable, and you won't find a single seam that gives away the image's past as a dozen separate images.

At this stage, you can use any image-manipulation program to correct color balance, retouch a flaw, or remove an unwanted object. You can also create hot spots that will cause things to happen, such as a text description to appear or an object movie to be displayed.

If you've created hot-spot buttons in an authoring package such as HyperCard or Macromedia Director, you're probably used to using a click-and-drag tool to select the area to be made hot. QuickTime VR approaches hot spots differently: you actually paint them using an imaging program. For example, to create a hot spot for a sculpture, you paint over the sculpture with a solid color. To create another hot spot for another sculpture, choose a different color and then paint it. By giving each hot spot a unique color, you enable QuickTime VR to distinguish between hot spots.

After painting hot spots, erase the rest

of the image and then use the Save As command to create a new image file containing only the hot spots. During a later phase of the development process, a QuickTime VR authoring tool combines this hot-spot image with the original panoramic. The painted hot spots don't appear on the screen when the VR movie is playing, but QuickTime VR knows where they are. When the mouse pointer moves over a hot spot, its shape changes to tell the viewer that he or she can click on the spot to make something happen.

The painting approach to creating hot spots is more laborious than an authoring program's draw-a-selection approach, but it has unique advantages. It allows you to create extremely precise hot spots—right down to the single-pixel level. And this makes possible dramatic on-screen effects, such as everything except the hot-spot object disappearing when you click on the object.

From One Place to Another

An important part of the QuickTime VR experience involves moving between locations. Making this experience possible requires creating a separate panoramic for each location, or *node*, and then using QuickTime VR's HyperCard-based scene editor to link the locations.

Making a conventional QuickTime movie means thinking like a movie director; making a multinode QuickTime VR movie means thinking like a tour planner. You must address such issues as where a user is looking and where the user can go from a given location. Multimedia developers have always had to think about navigation, but because a VR movie can display any portion of a 360-degree panoramic, developers must decide which portion of a panoramic should be visible when a user jumps to it. That view would vary depending on where the user came from. For instance, in my concert hall example, when you click on the exit-sign hot spot to jump to the lobby, you'd expect to be looking out at the lobby when you arrive there. It wouldn't make sense to click on the exit sign and then find yourself looking at the lobby door that leads back into the concert hall.

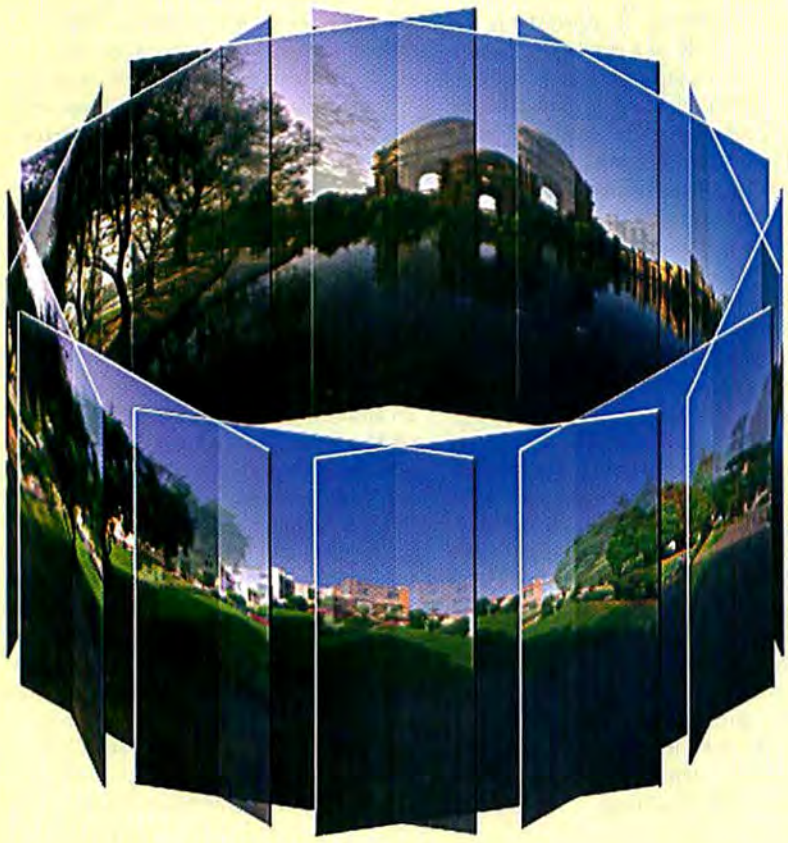
The scene editor helps you plan a virtual tour by enabling you to draw a top view of the entire scene and then add

HOW APPLE MAKES QUICKTIME VR FEEL REAL

Apple's latest foray into you-are-there technology, the QuickTime VR movie, sets you in the midst of a navigable, 360-degree scene and lets you explore the virtual environment. Apple's VR approach overcomes various problems inherent in patching together a series of flat images and projecting them onto a cylinder to create a three-dimensional feel. While competing technologies require the use of special, expensive, panoramic cameras, VR developers can use an ordinary camera to capture a scene that surrounds you and lets you pan up, down, and side to side.

Capturing the Scene

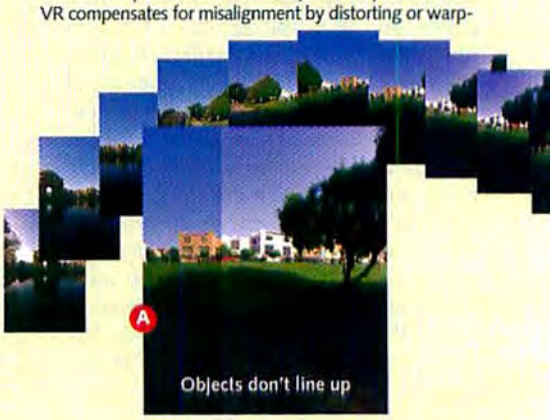
You capture a scene by shooting a series of overlapping photos. Mounting the camera on a tripod lets you keep the same center point as you swivel the camera; the tripod also keeps the whole series on a level plane, ensuring that the first and last shots in the sequence will line up.



PHOTOGRAPHY BY TED CASEY

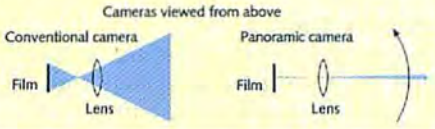
Making the Movie

You might think you could create a scene by simply butting pictures taken with a conventional camera up against each other (A). But unless taken with a panoramic camera, the pictures won't normally match up. QuickTime VR compensates for misalignment by distorting or warp-



Why QuickTime VR Emulates Panoramic Photography

A conventional camera exposes a whole rectangle of film all at once, and only the center of the frame faces the scene straight on. Toward the sides, the scene is exposed at an increasingly oblique angle, creating distortion. A high-end panoramic camera pans around a scene, exposing the film through a narrow slit. At any given moment, the camera captures a thin slice at the center of the camera's view, and the incoming light for each exposure hits the film straight on and without distortion.



nodes corresponding to each of the panoramics you've created. You can draw hot spots on a given panoramic that, when clicked, will display other panoramics. You can specify what part of a panoramic will be displayed when a user jumps to it.

The scene editor generates a series of PICT files containing the hot spots along with a file containing information that tells QuickTime VR what part of a panoramic to display. Another utility in the QuickTime VR authoring kit combines these files into a finished QuickTime VR movie—a single file containing as many locations as you defined.

The Bigger Picture

Most QuickTime VR movies are built into multimedia productions that also contain text, sound, still graphics, and linear QuickTime movies. Apple has created a series of external commands (XCMDs) that enable developers to access QuickTime VR movies within Director or HyperCard. The XCMDs extend Director's and HyperCard's capabilities, letting them open QuickTime VR movies, scale them to a specific size (most CD-ROM titles display QuickTime VR movies at the quarter-screen resolution of 320 by 240 pixels), and display a specific portion of a movie at a specific zoom setting. For developers, integrating finished QuickTime VR movies into a production is similar to integrating linear movies.

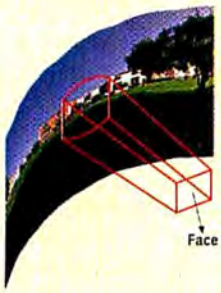
The QuickTime VR XCMDs also enable QuickTime VR to communicate with the authoring program by sending messages when various events take place. These messaging features enable a production to display text or pictures when someone clicks on a VR movie's hot spot.

Developers can also use the messages to play sounds—indeed, this is the only way the first release of QuickTime VR can work with sound. Future versions are likely to have more sophisticated sound features that will enhance the virtual reality experience. Imagine a virtual walk in the woods, where a babbling brook becomes louder as you approach it; imagine exploring a hotel room and hearing traffic noise increase as you approach the window. For now, you have to imagine these things, because the current incarnation of QuickTime VR is geared toward the eyes, not the ears.

ing **(B)** each image so that it appears as if it were taken by a panoramic camera. Once warped, images will match when they overlap **(C)**. QuickTime VR then analyzes the areas of overlap and blends, or *stitches* the images together **(D)**. Once all the images, including the first and last, are stitched together into a virtual cylinder, the panorama is complete **(E)**. Because QuickTime VR treats the scene as a single image wrapped inside a cylinder, you can pan around the image (instead of sliding along it as you would when it's flat). You can even pan up and down and continuously from side to side in either direction.

Viewing the Scene

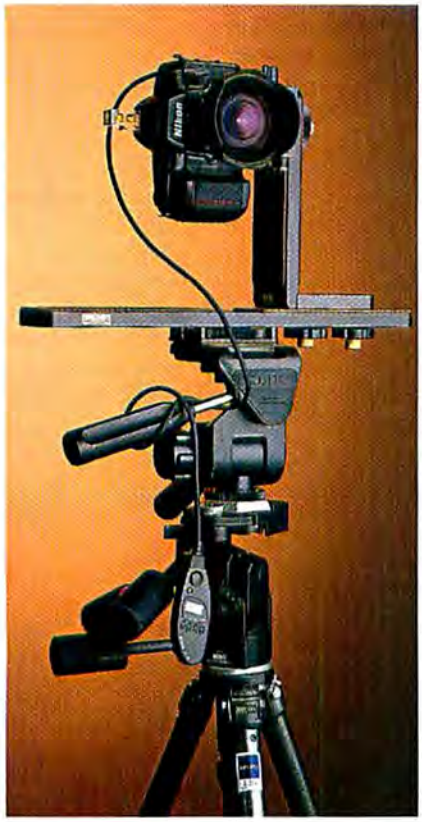
Now that you're done making the movie, you'll want to view it on a flat medium. As you might suspect, simply projecting a series of slices from the cylindrical image onto your monitor won't create a realistic view. To compensate for distortion caused by warping, and to heighten the realism, QuickTime VR manipulates the image, instantaneously, as you pan around the movie.



QuickTime VR compresses the image in the center. This compression makes objects increase in size as they move toward the edge of a view, giving side-to-side panning a more realistic feel.

To increase the realism of a vertical pan, QuickTime VR brings data in from the sides of the image at the top (as you pan up) or bottom (as you pan down). This simulates the sensation that your field of vision broadens as you look up or down, as it does in real life.

PHOTOGRAPHING FOR QUICKTIME VR



MARK JOHANN

To avoid optical distortion when creating a photographic panoramic, you must mount the camera so that it rotates around its optical center.

JOHN BOKEN

The camera on the far left uses an array of brackets (available at photo dealers) to offset the camera from the tripod head. Small levels attached to the camera's flash mount enable you to adjust the tripod head so that the camera is level—if it isn't, the last photograph in the panoramic will not match up to the first. A simplified mounting bracket (near left) is being developed by Peace River Studios (617/491-6262). Rube Goldberg tripod mounts aren't all you need for QuickTime VR development. You also need a fast Mac with at least 40MB of RAM to run Apple's $2000 QuickTime VR authoring tools software. And don't expect click-and-drag moviemaking; the authoring tools, which rely on Apple's Macintosh Programmer's Workshop (MPW) programming environment, use a crude text-based interface. They're extremely powerful, but the learning curve is steep.

The Last Word

The future of QuickTime VR looks auspicious. Apple has already demonstrated enhanced versions of QuickTime VR that enable Power Macs to display full-screen VR movies. And there's no reason that QuickTime VR couldn't be made to work with the inexpensive video-game gloves and television glasses available today. Low-cost peripherals like these would help make QuickTime VR more like goggles-and-gloves virtual reality.

In the near term, though, consumers will encounter QuickTime VR on their video monitors, and primarily in CD-ROM titles. That's too bad—you've probably thought up a few fun ways to use QuickTime VR already, and if you're an architect, real estate agent, teacher, or travel agent, you can probably imagine some genuinely valuable ways to put it to work. For now, we'll explore QuickTime VR movies instead of creating them.

As for developers, there are definitely content and marketing advantages to catching the QuickTime VR bandwagon, but the cost of ridership is high. In addition to the mountainous learning curve of the QuickTime VR authoring tools, there's the price: besides the $2000 it charges for the authoring tools, Apple requires a royalty of 40 to 80 cents per unit on CD-ROMs containing QuickTime VR movies. (The amount varies depending on how many VR movies a title has; there are no royalties for noncommercial applications.)

Pioneering QuickTime VR developers I talked to were not pleased with the idea of paying Apple royalties in perpetuity. Some have halted their efforts in the hopes that Apple's policy will change. Peter Black, president of Xiphias, whose titles include a CD-ROM based on the Mighty Morphin Power Rangers, expressed similar frustrations: "The technology and its visual effect are extraordinarily powerful, but Apple has treated it as if it were a crown jewel . . . I've seen this at Apple before—it's very frustrating."

What's more, QuickTime VR has competition—and wouldn't you know, it's from Microsoft. At the Winter 1995 Consumer Electronics Show, Microsoft announced Surround Video, which provides full-screen panoramic movies for 486 or faster Windows machines. Surround Video has serious limitations compared with QuickTime VR, starting with the fact that it's vaporware: it won't be available until Windows 95 ships. Also, you can't zoom in and out on Surround Video movies, and developers must use a panoramic camera to shoot scenes—there's no equivalent to the QuickTime VR Stitcher. (This impacts not only costs but also quality: panoramic cameras typically have a smaller vertical field of view than the camera configuration Apple recommends for QuickTime VR movies.) But the Surround Video development tools will be free, and Microsoft will not charge royalties on Surround Video titles.

QuickTime VR is an impressive achievement that reinforces Apple's role as the innovator in personal computer multimedia. But Apple's zeal to turn QuickTime VR into a profit center may slow its initial adoption and perhaps even relegate it to the backseat of Microsoft's limousine. As this issue went to press, Apple was reconsidering its requirement that developers pay royalties on titles that incorporate QuickTime VR. As well it should. Whether we're talking about QuickTime VR or the Macintosh Operating System itself, Apple needs to make its technology more accessible in order to gain the market share it needs. There's nothing virtual about that reality. m

Contributing editor JIM HEID is the author and producer of *Macworld Complete Mac Handbook Plus Interactive CD*, third edition (IDG Books Worldwide, 1994).

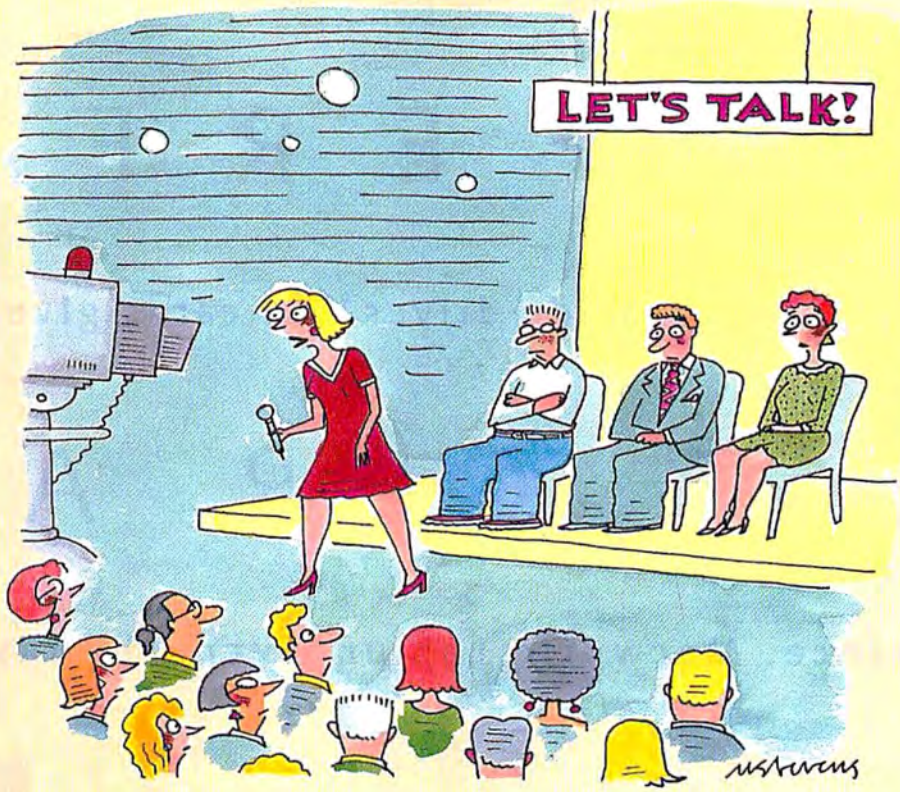
THE BEST

PRINTER

FOR YOUR MAC

ISN'T

AN APPLE.



"Today's topic... Apple users who didn't buy a Texas Instruments printer and lived to regret it!"

If you work with a Mac, you don't have to pay a premium price for a printer. For TI printers cost significantly less than Apple equivalents and our remarkably economical 600 dpi printer costs less than Apple's 300 dpi printer. In addition, our laser printers work with Windows/DOS compatible PC's as well as Macs. Another premium feature is superior paper handling. And with longer-lasting consumables, TI printers can save you thousands of dollars. Finally, there's one feature you'll love: ease of use. Because with TI printers, you automatically switch from one platform to another. With so many premium features, TI printers are sure to attract a lot of new fans. For more information call 1-800-TI-TEXAS.

ALL TI LASER PRINTERS:
600 dpi. Mac®/Windows™/DOS compatible.

MICROLASER™ POWERPRO
UNDER $1,750
Ideal heavy-graphics printer. 12 ppm, 67 scalable fonts, turbo-charged processor. ***Also available, the economical Pro E 12 ppm printer for under $1,450.***

MICROLASER PRO 600
UNDER $1,300
Feature-packed, high-performance printer. 8 ppm, 500-sheet capacity (two 250-sheet paper trays).

MICROLASER 600
UNDER $900
Ideal personal desktop printer. 5 ppm.

Circle 266 on reader service card

*Available on Power Pro printers purchased between March 1 and June 30, 1995. All prices are estimated street prices. Dealer prices may vary. microLaser and "Extending Your Reach" are trademarks of Texas Instruments. Mac is a registered trademark of Apple Computer, Inc. PostScript and the PostScript logo are registered trademarks of Adobe Systems, Inc. Windows is a trademark of Microsoft Corporation. © 1995 TI.

Adobe PostScript

EXTENDING YOUR REACH™

TEXAS INSTRUMENTS

SUPERFAST STORAGE

SCSI-2 Fast/Wide drives and cards give ultimate performance. Macworld Lab uncovers the fastest of the fast.

MW LAB

PERFORMANCE, SPEED, RESPONSIVENESS—BY ANY NAME, YOU KNOW you need it. Your Photoshop files are getting bigger all the time, your Premiere projects require full-screen video, and you're now scheduling 4th Dimension searches to run during your lunch break. Almost every product in the latest crop of high-capacity hard drives features SCSI-2 Fast capability, but many drives now feature SCSI-2 Fast/Wide capabilities, with the promise of the fastest possible performance. To discover whether SCSI-2 Fast/Wide capabilities offer a significant performance advantage over the more common SCSI-2 Fast–only drives, Macworld Lab took a definitive look at high-capacity hard-drive performance, analyzing all the elements that go into tuning your drive subsystem for maximum performance.

We tested 12 drive mechanisms, 6 formatters, and 2 SCSI-2 Fast/Wide cards in search of that elusive combination that would yield the best performance. Our tests confirm some basic assumptions: that for best results you need to buy a third-party SCSI-2 card, rather than rely on the Mac's internal SCSI interface—even the fast internal SCSI-2 interface available only on the Power Mac 8100.

Macworld Lab's results show that a Fast/Wide drive used with a SCSI-2 Fast/Wide accelerator card provides the best possible performance, which you'll want if your tasks include video editing, file service, prepress, and large database applications.

You need a combination of drive and card because both contribute to the overall speed. The accelerator itself increases a Fast-only drive's performance by 10 to 15 percent. And moving from Fast to Fast/Wide gains an extra 5 percent, according to our tests of the same mechanism in Fast-only and Fast/Wide drives.

All current Macs use standard SCSI-2 for the external port, but only the Power Mac 8100 uses SCSI-2 Fast for its internal SCSI connector. (Don't mix Fast and non-Fast drives on the same SCSI chain; doing so degrades the speed of the Fast devices.) No Mac has built-in Fast/Wide connections, so for top performance you need one of the two SCSI-2 Fast/Wide accelerator cards: FWB's JackHammer ($799; 415/325-4392) and Atto's SiliconExpress IV ($995; 716/691-1999).

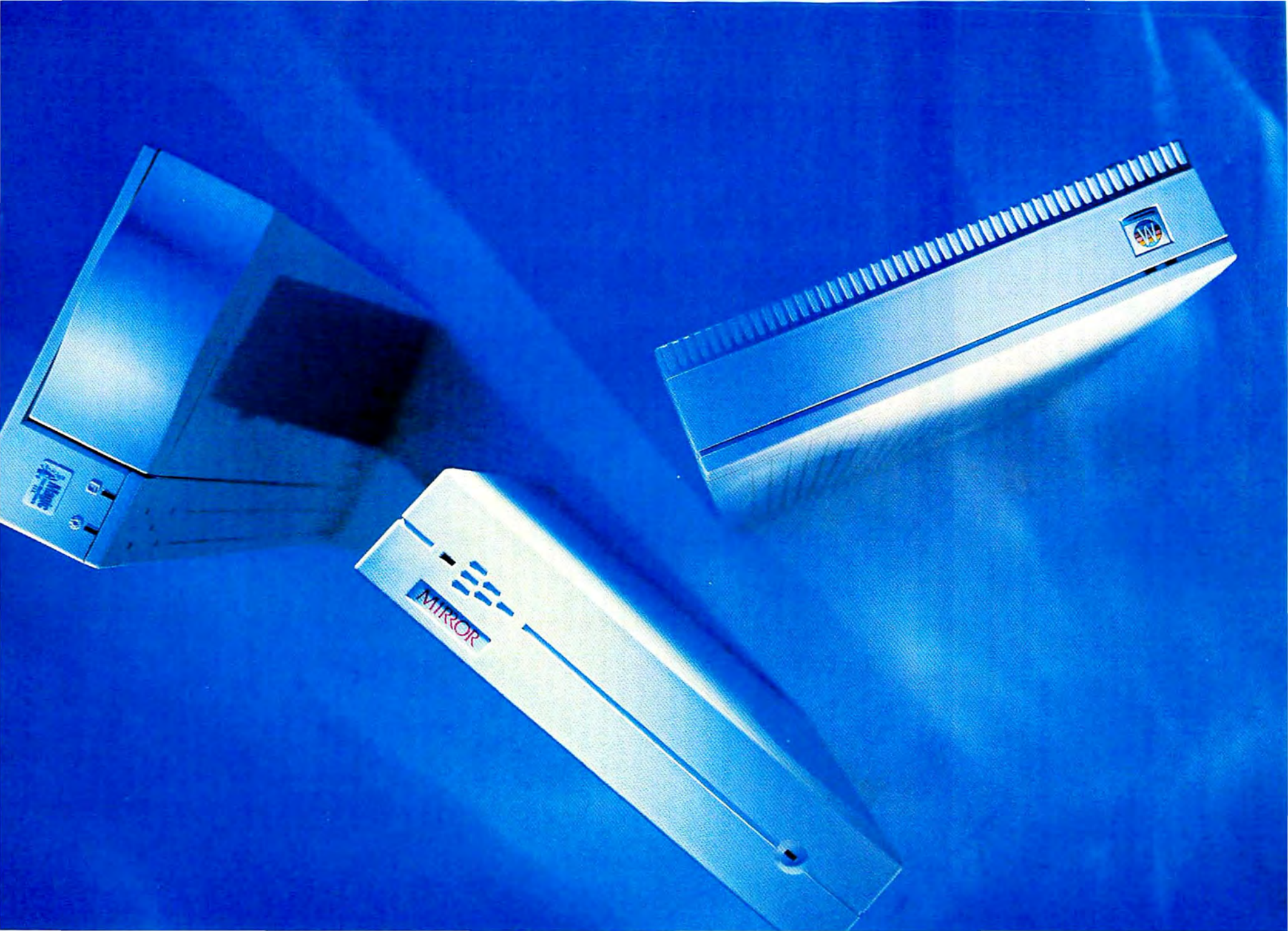
A Drive Isn't Enough

A SCSI accelerator is a must for high-speed data transfer because out of the box your Macintosh doesn't provide optimal SCSI performance. It costs more to build a high-speed SCSI interface, particularly Fast/Wide, and since not everyone needs a high-speed SCSI interface, Apple doesn't build one into the Macintosh. (Apple does build a Fast interface into the Power Mac 8100 because those users tend to need the extra performance.)

Making the choice between the JackHammer and the SiliconExpress IV will depend on your needs. The JackHammer

by Matthew Leeds

PHOTOGRAPHS BY STAN MUSILEK


MIRROR

is a less expensive card by $200 (a 20 percent savings) and has been available for a longer period of time. But the SiliconExpress IV card generally offers a 10 to 20 percent speed advantage, according to Macworld Lab tests. Plus its 7-inch size means it fits in any Mac with a NuBus slot (the FWB card is 12 inches long).

Evaluating Drive Options

Macworld Lab found that not only was one IBM mechanism at the top of the ranking, but it also had a substantial lead. The DFHSS2W UltraStar mechanism consistently outperformed all other mechanisms in every test but the video throughput, where it fell behind by only 0.2 MBps. The UltraStar was the only mechanism to use both magneto-resistive heads and PRML read channel technology, and this may be the reason for its stellar performance (see the sidebar, "What Affects Drive Performance: New Technologies Push the Pace," for details). However, the UltraStar mechanism is not widely available; at press time, only Mirror Technologies (612/270-2718) and MacProducts USA (512/892-4070) offered drives using it.

We found only marginal differences among most of the other Fast/Wide mechanisms. The Fujitsu, Seagate Hawk, and all the non-Fast/Wide mechanisms fell well behind all the other drives.

All the top mechanisms offered video-capture rates at or above 5 MBps, which is more than adequate for working in S-VHS or Hi8 at full-size standard frame rates. If you are working in these video

WHAT AFFECTS DRIVE PERFORMANCE: NEW TECHNOLOGIES PUSH THE PACE

Top performance is achieved by a combination of factors, some inside the drive and some inside the Mac. Understanding the issues that affect performance will help you pick the best drive for your needs.

SCSI Variations The technology in SCSI hard drives has evolved considerably since the release of the Macintosh Plus in 1985, the first Mac (indeed, the first personal computer) with a SCSI port. So has the technology behind the SCSI port in every Mac. Today, there's SCSI-2, a faster version of the SCSI standard. SCSI-2 has several variants including Fast, Wide, and Fast/Wide. SCSI-2 Fast sends data at a maximum rate of 10 MBps, versus SCSI's original 5-MBps maximum; SCSI-2 Wide sends 16 bits of data along the bus rather than the original SCSI's (and SCSI-2 Fast's) 8 bits, which doubles the data-transfer rate; and SCSI-2 Fast/Wide does both, for a maximum transfer rate of 20 MBps, or four times that of plain SCSI-2. (No one has chosen to sell Wide-only drives; currently, all drives that implement SCSI-2 Wide also include SCSI-2 Fast.) Standard SCSI-2 (also called SCSI-2 Narrow) transfers data at a maximum rate of 5 MBps using an 8-bit channel. Drives and cards that support the SCSI-2 Fast/Wide standard usually ship with a 68-pin connector common on PCs, not the usual 50-pin Centronics connector.

SCSI continues to evolve, and companies such as Apple are investigating which aspects of this ongoing evolution to adopt (see the feature "The Future of SCSI," in this issue).

Inside a Drive While just moving to a Fast/Wide system can provide significant gains, there is a wide range of performance among Fast/Wide drive models. The reasons for this difference are drive delay, the use of a cache, and the use of new drive technologies.

Delay is the result of several elements. It takes some time for a drive head to move from one track to the next and to stop moving. It also takes some time for the next whole data sector to rotate into place beneath a drive head. Plus, if the data required is not in contiguous tracks, it takes even more time to move to the correct track. Finally, there is some lag in the interpretation and execution of each SCSI command sent to a drive: different drive makers achieve different levels of efficiency in writing the drive's firmware—the programs embedded in the drive's electronics that interpret the SCSI commands.

Each drive also has a cache; it's typically anywhere from 64K to 1MB. Sometimes a drive gets read requests one sector at a time. The drive reads data from an entire track (which contains several sectors) into the cache, on the assumption that the next data request will be on a sector from the same track (since data is written to disk in consecutive order whenever possible). If that assumption is true, the drive can immediately send the data to the Mac; if it is not true, the drive then moves the drive head to the correct location for the requested data. Similarly, the cache can be used to hold information from the Mac until the drive is ready to write the data to disk, rather than making the Mac pause the data transmission. Not all caches are equally efficient, and not all drives ship with their cache memory enabled for read and write buffering. All but one of the drives we tested had either 512K or 1MB of cache memory (the Seagate ST31200W mechanism had 256K).

The type of drive head also affects performance. Most of today's drives use magnetic thin-film technology, which relies on heads similar to the ones found in an audiocassette player. As the disk rotates under the head, it induces a minuscule electronic signal, which the head then amplifies, filters, and converts into data. But a newer type of head, called magneto-resistive, operates on a different principle. Exposure to a magnetic field alters the resistance to electrical current in the metals used in the heads. The heads have a constant electrical current that responds to the disk's magnetic fields; the head mechanism converts the variations in current into data. Magneto-resistive heads require less power than thin-film heads, can pack bits closer together (which speeds reads and writes), and can more easily move between tracks.

Along with magneto-resistive heads, another new technology is starting to show up in drives. Partial-response, maximum-likelihood (PRML) is a digital method of reading and separating a signal from the noise on drive media. PRML uses a set of algorithms originally developed for communication with deep-space probes. With better signal discrimination comes higher bit and track densities, which improve data throughput. Also, PRML works well at lower rotational speeds, letting drive designers trade off rotational speed against bit density. Lower rotational speeds reduce noise, heat, and power consumption in drives, and may increase drive life.

Several companies are using magneto-resistive heads and PRML signaling in smaller drives intended for laptop systems, where lower power consumption and rotational speeds are significant. Only IBM has introduced a multigigabyte hard

formats, this rate eliminates the need for a RAID Level 0 system.

Technical support is one of the biggest considerations in buying Fast/Wide drives, since the technical quality of the products is based largely on the mechanism and card makers.

In checking support and warranty, we found that of the vendors who responded to our requests for product information, both Direct Connections and Optima provided excellent technical support, FWB provided very good support, and

High-Speed Essentials To get maximum drive performance, you need a SCSI-2 accelerator card, either Atto Technology's faster SiliconExpress IV (bottom) or FWB's cheaper JackHammer.

drive using the two technologies: the UltraStar series.

Seagate has tried another approach to improving the sustained data-transfer rate—implementing a dual-head parallel design. By splitting the data stream into two channels and servicing each channel with a separate set of heads, the Seagate mechanism doubles the internal data rate. This is essentially a RAID Level 0 system in a single mechanism and is found in the Seagate ST12450W, which we also tested. (See "The RAID Option," *Macworld*, April 1995, for details on RAID.)

Inside a Macintosh In configuring any system you must look at all the components to find potential performance bottlenecks, and the Mac offers several of its own when it comes to SCSI throughput.

When Apple introduced SCSI Manager 4.3 with the AV Macs, it added support for special SCSI-2 features, such as multiple buses, asynchronous input/output, and disconnect/reconnect. Multiple-bus support was essential for the Power Mac 8100 and also comes in handy if you add a SCSI card. Asynchronous I/O lets the OS send a request to a SCSI device for a read or a write and then continue with another process without waiting for the SCSI device to return the results of the request. With disconnect/reconnect a SCSI device that receives a command can drop off the SCSI bus to execute the command, then come back on the bus when finished. When multiple devices are on a SCSI bus, this can improve performance.

SCSI Manager 4.3 also finally enabled SCSI Direct Memory Access (DMA) on those machines whose hardware already supported it, such as the AV Macs. DMA lets data from the SCSI bus be moved directly into memory without intervention by the CPU. This can also boost performance by not slowing the preparation or interpretation of data between the Macintosh and the drive.

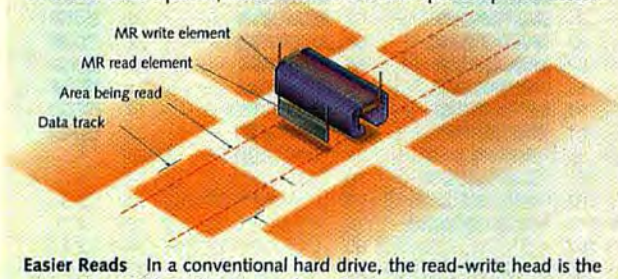
While System 7.5 raised the maximum size of a volume from 2GB to 4GB, it did not change the maximum size of a file (2GB) or the maximum number of files on a volume (about 65,000). While these limits may seem generous, they are not. Individual digital-video files, particularly when you are working with high-quality source material such as Betacam, can easily be in the gigabyte range. And with 4GB of space, it's easy to collect more than 65,000 files in one place. A short-term solution to the maximum file-count problem is to partition a large drive into more than one logical volume. All formatting software offers this function, and it's one of the first things you should consider adjusting when you buy a large hard drive.

Formatter Effects While the mechanism and accelerator card provide the bulk of the performance, the formatter can also make some difference. But although we did find some performance differences between drivers when drives were connected to the Macintosh Power Mac 8100/80 SCSI bus, the Macworld Lab tests showed that a third-party SCSI card was the only way to get maximum drive performance and access to Fast/Wide drives.

We tried several third-party drivers and quickly discovered that none of them deliver performance equal to each card's native driver. In addition, both the FWB and Atto cards include a utility for changing the SCSI mode pages, the parameters in each drive that control such things as enabling the drive's internal cache. This lets you fine-tune performance for your storage needs. At press time several other vendors were working on similar utilities.

Why MR Drives Are Better

Magneto-resistive (MR) technology makes it possible to put more data on a hard drive's platter, which reduces cost and speeds up data access.



Easier Reads In a conventional hard drive, the read-write head is the same width as the data track, so the head must be almost exactly centered over the track to avoid misreading data. In MR heads, the read and write elements are separate structures. The write element is similar to the combination read-write head in conventional drives, but the MR head's read element is a thin conductive strip, narrower than the write element. Because the read head is narrower than the data track, it need not be centered exactly, so the drive spends less time fine-tuning the head's position.

Denser Data Conventional heads read data by sensing the current generated in the head's element as it passes through magnetic fields (which represent the data) on the platter. This technique requires that the head read data at a constant rate, which in turn means that data on outside tracks must be written more loosely than on inside tracks to compensate for the faster speed at which the outside tracks pass by the head. In contrast, an MR read head generates its own current and senses how the platter's magnetic fields react to it. This technique doesn't require a constant read rate so data can be placed at maximum density in all areas of the platter. The MR read head's size also helps. The smaller MR head is more sensitive to the magnetic fields and can handle more densely packed data.

both Micropolis and MicroNet provided acceptable support. For Direct Connections, the excellent rating marks a significant improvement over past evaluations. Micropolis's support technicians demonstrated little knowledge of the products, and in two of three cases tried to get us to call someone else for support. The company was barely above the cusp between a score of acceptable and poor, and then only because the technicians in two instances did answer our callers' questions after the callers wouldn't take "go elsewhere" for an answer. At MicroNet, two technicians provided quick, knowledgeable answers, but a third passed the buck to FWB, resulting in an average score of acceptable.

We also checked support at several other companies who declined to provide product information. How did those other companies stack up? MacProducts USA (512/892-4070) was unacceptable, essentially deferring calls to FWB; MaxConcept (619/530-9062) was acceptable, although in two calls we got excellent support and in a third call we were told to call FWB; Microtech was poor because of a generally unhelpful set of responses; Mirror Technologies bordered between poor and unacceptable, since its technicians passed the buck to the SCSI accelerator card vendors FWB and Atto; and Tulin Technology was unacceptable because it would not help our callers.

For both sets of companies, it's interesting to note that many of them suggested calling FWB, recognizing the FWB SCSI accelerator's support for Fast/Wide drives. Also interesting was the fact that two of the five companies that provided detailed product information (Optima and MicroNet) offer only a one-year warranty, despite the fact that the original manufacturer of the drive provides a five-year warranty. Worse, Optima charges for the optional extension to its one-year warranty coverage.

MW LAB

How to Get the Fastest Hard Drive Possible

In order of overall performance from fastest to slowest. Times are in seconds. Shorter bars are better.

Italics indicate non-Fast/Wide drives tested for comparison.

Macworld Lab's tests of high-performance hard drives show the SCSI-2 Fast/Wide drives using the Atto SiliconExpress IV accelerator card to be clear winners. For comparison, we tested three SCSI-2 Fast drives on the Power Mac 8100's internal connector using CharisMac's Anubis 2.52 drive formatter. In tests of SCSI cards, Atto edged out FWB, as shown in the results of the IBM UltraStar. We also found that drivers included with SCSI cards, rather than those bundled with the drives, yield best performance: compare the Micropolis Capricorn with CharisMac Anubis and the same drive with FWB ToolKit, both on FWB's JackHammer.

Relative Speed: 90%–100% | 80%–89% | 70%–79% | 0%–69%

IBM's UltraStar Mechanism Outperforms All Others

	Mechanism**	Overall Index	Search 4D Database	Open Adobe Photoshop File	Save Adobe Photoshop File	Duplicate in Finder	Capture Video (in MBps)*
1.00	IBM DFHSS2W UltraStar	167	79	56	18	5.4
0.90	Seagate ST15150W	170	84	63	22	5.3
0.89	Seagate ST12450W	173	83	68	22	5.6
0.87	Micropolis 4221 Taurus	208	82	65	21	5.1
0.86	Micropolis 3243 Capricorn	207	84	66	21	5.6
0.85	Seagate ST410800W	184	91	66	24	5.0
0.84	Micropolis 1991 Scorpio	231	81	67	22	5.5
0.83	Seagate ST12550W	171	93	71	25	4.2
0.79	*Seagate ST12550N****	181	101	70	27	3.1
0.71	Fujitsu M2694EQ-512	207	102	79	32	2.5
0.70	*Seagate ST12550N*****	183	111	79	39	2.7
0.69	Seagate ST31200W	198	102	85	36	3.0
0.69	Micropolis 1991 Scorpio*****	231	99	86	30	3.0
0.69	*Seagate ST32550N*****	187	107	88	36	3.1

*Larger number is better. **Tested using the Atto SiliconExpress IV card unless noted. ***Tested using the Atto SiliconExpress IV card and a SCSI-2 Fast/Wide-to-Standard SCSI cable. ****SCSI-2 Fast drives tested for comparison, used with a Power Mac 8100's internal SCSI-2 Fast connector.

For Any Drive, Atto's SCSI-2 Card Is Fastest

Results with the IBM DFHSS2W UltraStar mechanism; we had similar results with other mechanisms.

1.00	Atto SiliconExpress IV v1.4	167	79	56	18
0.87	FWB JackHammer 1.6	205	89	58	21

No Matter What Drive, Formatters Don't Make a Huge Difference

Results with the Micropolis 3243 Capricorn mechanism and FWB JackHammer 1.6 card; we had similar results with other mechanisms.

0.73	FWB ToolKit 1.6.2	248	91	76	28
0.69	CharisMac Anubis 2.52	245	99	81	30

BEHIND OUR TESTS

Macworld Lab tested high-performance hard drives using our standard suite of business and graphics applications. To show the effect of fast access, we ran an unindexed search of a 96,775-record ACI US 4th Dimension database. For an indication of data throughput, we opened and saved a 40MB file in Adobe Photoshop. To determine general performance, we duplicated a 40MB file in the Finder. For video capture, we used a Radius VideoVision Studio to capture 30 frames per second at 640-by-480-pixel resolution with adaptive compression. The rate shown represents the best rate obtained without dropping frames on capture or playback. The Overall Index does not include video capture.—**Macworld Lab testing supervised by Tim Warner**

Who Offers Fast/Wide Drives?

Company	Product	Price (List/ Company's Estimate) *	Mechanism	Capacity	Warranty (in years)	Phone	Toll-Free Phone	Technical Support
FWB	Pocket Hammer 1760 FMF-W	$2799/$2425	Seagate ST12450W	1.8GB	5	415/325-4392	none	very good
	Pocket Hammer 2050 FMF-W	$2599/$2259	Seagate ST32550W	2.1GB	5			
	Pocket Hammer 4100 FMF-W	$3639/$3169	Seagate ST15150W	4.1GB	5			
Direct Connections	DC 1.7 SW	$1499/NP	Seagate ST12450W	1.7GB	5	612/937-6283	800/572-4305	excellent
	DC 2.1 CW	$1175/NP	Conner CFP2107W	2.1GB	5			
	DC 2.1 QW	$1095/NP	Quantum XP321140W	2.1GB	5			
	DC 2.1 SW	$1295/NP	Seagate ST12550W	2.1GB	5			
	DC 4.2 SW	$1745/NP	Seagate ST15150W	4.2GB	5			
	DC 4.3 CW	$1799/NP	Conner CFP4207W	4.3GB	5			
	DC 4.3 QW	$1795/NP	Quantum XP34300W	4.3GB	5			
	DC 9.0 SW	$3245/NP	Seagate ST410800W	9.0GB	5			
MicroNet Technology	SBW-8670	$5595/NP	Seagate ST410800W	8.7GB	1	714/453-6000	none	acceptable
	SSW-1800	$2895/NP	Seagate ST12450W	1.8GB	1			
Micropolis	Capricorn 4 Model 3243W	$2745/NP	Capricorn 4 Model 3243W	4.3GB	5	818/709-3300	800/395-3748	acceptable
	Scorpio 9 Model 1991W	$4670/NP	Scorpio 9 Model 1991W	9.1GB	5			
	Taurus 2 Model 4221W	$1850/NP	Taurus 2 Model 4221W	2.1GB	5			
Optima Technology	Concorde 9000W	$5150/$5045	Seagate ST410800W **	9.0GB	1	714/476-0515	none	excellent
	DisKovery 1800 DHW	$2195/$1995	Seagate ST12450W **	1.8GB	1			
	DisKovery 2100W	$1995/$1895	Seagate ST32550W **	2.1GB	1			
	DisKovery 4100W	$3250/$3175	Seagate ST15150W **	4.1GB	1			

*Technical-support ratings are based on a series of calls made to each company by Macworld staffers (posing as customers) to gauge the accessibility, helpfulness, and accuracy of the company's support technicians. Macworld uses a point system, including bonuses and demerits, to derive the final rating. Ratings are for companies, not individual products. * Actual prices will vary; they might be lower than the list price or higher than the estimated street price provided by the company. NP = Not provided by company. ** Company would not provide information on mechanisms used; mechanisms listed are based on Macworld Lab research.*

It's important to note that although we list a product name and the mechanism in that product, companies often change the mechanism they use for a given product, and if you want a specific mechanism, your best bet is to ask for it directly. That's why, for example, you'll see some mechanisms in the product table, "Who Offers Fast/Wide Drives?" not tested by Macworld Lab; those mechanisms were not available at test time.

The Last Word

Buying a hard drive these days is a little like buying any appliance: you do comparison shopping, checking out the specifications, price, and other features in an effort to get the maximum value for your money. Like computer makers, disk drive manufacturers now plan their products' life cycles to be less than a year. Within that time, the company introduces a new generation of drives, and deeply discounts what a year earlier was the top-of-the-line drive. That means you should buy the best you can now, knowing that it won't be the fastest later.

When you buy a drive, you are purchasing three things. One is the actual hardware: the drive itself, and possibly an external case to contain it. The second is the software: while most drives come preformatted these days, you should still get a formatter that installs the disk driver and may also let you adjust the mode-page settings. But this is not a very important factor with SCSI-2 Fast/Wide drives, since you need an accelerator to use them, and the accelerators come with better-tuned formatters, as we found out in our testing. The third is customer support, which includes a warranty and technical support. Virtually all drive mechanisms larger than 1GB now come with a five-year manufacturer's warranty. Surprisingly, six of the companies we contacted offer shorter warranties for the drives they sell. When the vendor's warranty runs out before the manufacturer's warranty does (or if the vendor goes out of business or discontinues support of your drive), you may still have repair coverage from the original maker of your drive's mechanism.

Resellers often sell drives by their own brand name rather than the brand name and model number of the original producer. This can make getting the precise mechanism you want difficult.

When shopping, keep in mind that some resellers will give you a better deal if you buy the SCSI-2 accelerator and drive as a bundle than if you buy them separately.

The lesson is clear: Get the fastest drive you can afford and the fastest card you can afford. While any of the current SCSI-2 Fast/Wide options should be sufficient, you'll later appreciate having that little extra since performance requirements never go down, only up. ■

MATTHEW LEEDS is the technical-services manager for a large software developer.

HIGH-PERFORMANCE DRIVE SYSTEMS

MW EDITORS' CHOICE

We selected the components that provide the best performance for the demanding tasks that justify the purchase of a SCSI-2 Fast/Wide drive subsystem. Performance needs outweigh the fairly small price differences in today's offerings.

Accelerator Card

SiliconExpress IV Outstanding performance and small size make this card worth the extra money. **Company:** Atto Technology. **List price:** $995.

Drive Mechanism

IBM UltraStar series These drives offer excellent performance in a SCSI-2 Fast/Wide implementation. **Manufacturer:** IBM (available from several resellers). **Price:** Varies by reseller.

The Future of SCSI

SCSI HAS VEXED MAC OWNERS FOR A DECADE.

BY JIM HEID

For the feature "Superfast Storage," in this issue, Macworld Lab tested the very highest-performance storage systems that are available today. But the storage landscape is likely to change significantly over the next year. Faster drive mechanisms will become available, as will faster SCSI interfaces that can keep up with the hot new drives—drives that meet the data-transfer demands of color imaging, multimedia, client/server networking, and other business needs.

These new SCSI interfaces will be available as cards that plug into Peripheral Component Interconnect (PCI) expansion slots slated to replace NuBus in the next generation of Power Macs—the NuBus slots that Macs have used since 1987 are just too slow to accommodate the newer high-throughput SCSI (see "Why PCI," *Macworld*, June 1995). There are several new implementations of SCSI on the horizon, but they all fall under one umbrella: SCSI-3. Still making the rounds of the standards committees, this latest version of the venerable SCSI standard supports the existing SCSI protocols as well as several different interface designs and data-transfer schemes. In many ways the new protocols have little in common with each other or with the SCSI buses that Macs have used since 1986—each uses different cabling and connector schemes and different data-transfer methods—but all support SCSI-3's expanded set of commands used to control disk drives and other peripherals. The SCSI-3 standards committees have taken a big-tent approach, intentionally designing the specification to support multiple implementations. Put another way, SCSI-3 is a specification that encompasses several buses.

Three of the four SCSI-3 implementations will simplify your life by eliminating the aggravation of setting address switches and adjusting terminators—the devices will configure themselves when you plug them in. SCSI-3 shatters the 7-device limit, in some cases supporting up to 127 devices on a single bus. And the devices themselves will be hot-pluggable: you won't have to shut down the Mac to install them.

The transition to SCSI-3 won't be pretty, however. There's enough jargon to choke an astronaut, and sorting out the players and the lingo is a job in itself. What's more, each protocol will become available on a different schedule; some of the most promising won't surface until the end of 1995 or later. Expect an unsettled market next year.

Finally, each protocol has its own niche: although all allow for fast data transfer, some are more likely than others to find a place in the Mac storage world. Some are likely to be used for networking as well as storage, while others will provide fast, easy methods of attaching video cameras and other multimedia gear. Thus, if you're looking for maximum performance for a specific data-transfer task, it will be important to choose the right bus for the job.

Shifting into Serial

SCSI has always been a parallel bus—the bits that make up each byte of data travel alongside each other, each in its own wire (which you can see by looking in a SCSI connector). By comparison, the Mac's modem, printer, and ADB ports are serial buses—bits travel single-file, one behind the other. In the past, parallel buses have always been faster than serial ones, just as it's often faster to travel on a multilane freeway, which can carry more cars than a one-lane road.

But bits aren't cars and cables aren't freeways, and at a certain point, a parallel interface becomes a liability. To speed up a parallel interface you can add more wires to its cables, and you can speed up the clock that regulates the bus. But both changes increase the risk of cross talk and radio-frequency interference between wires, which limits cable lengths and requires more electrical shielding. This use of more shielding, more wires, and the bigger connectors that more wires demand increases the cost of faster parallel buses. And once the clock sur-

passes a certain speed, no reasonable amount of shielding can prevent interference.

Serial buses have fewer wires packed in side by side and are resistant to interference, even at very high clock speeds and over very long cables. It's for these reasons that three of the four SCSI-3 protocols rely on serial data-transmission techniques. Through sophisticated signaling schemes, serial SCSI protocols can blast more data through less-

Another reason Ultra SCSI warrants attention is that Quantum and Seagate, two of the biggest players in the Mac storage market, have announced Ultra SCSI mechanisms. (Hewlett-Packard has endorsed Ultra SCSI but has not yet committed to manufacturing Ultra SCSI drives.) Quantum has announced the Grand Prix XP34301, a 2.1GB mechanism, and the Grand Prix XP32151, a 4.3GB drive. Both should be shipping by the time you read this. Seagate will

WILL THE NEW SCSI-3 END THE HASSLES?

expensive cables than can their parallel predecessors (see the diagram "What Makes SCSI-3 So Fast?").

But First, Ultra SCSI

Making the transition to serial SCSI commits hard drive and interface manufacturers to a major engineering effort. What's more, competing camps of drive manufacturers have formed around each of SCSI-3's serial SCSI protocols. While waiting for the dust to settle, some storage vendors are turning to a SCSI-3 spec that is an enhanced version of the parallel SCSI architecture, called Ultra SCSI.

By doubling the SCSI clock rate from 10MHz to 20MHz, Ultra SCSI promises a doubling of the maximum sustained-transfer rate: while SCSI-2 Fast and Wide maxes out at 20 MBps (see the feature "Superfast Storage," in this issue), Ultra SCSI supports rates of up to 40 MBps.

offer an Ultra SCSI version of its Barracuda 4, a 4.3GB drive.

The downside of Ultra SCSI is that, as a parallel bus, it does not address SCSI's finicky cabling requirements. If anything, Ultra SCSI's fast data-transfer rates make issues such as cable length and cable quality more critical. Conventional (sometimes called single-ended) Ultra SCSI cables, which have only one ground line for all the data lines, use 68-pin or 80-pin connectors and have a maximum length of 1.5m. A special data-transmission-and-cabling scheme, called differential signaling, provides a separate ground line for each data line and thus can support much longer cables. But differential signaling costs more and introduces its own installation and compatibility issues. For example, you cannot connect both differential and single-ended devices to the same SCSI bus.

JEFF BRICE

Exotic New Flavors of SCSI: What Features Do They Offer?

	Standard SCSI	SCSI-2 Fast/Wide	Ultra SCSI	Fiber Channel	FireWire	SSA
Hot-pluggable	no	no	no	yes	yes	yes
Self-terminating	no	yes	yes	yes	yes	yes
Automatic address configuration	no	no	no	yes	yes	yes
First uses	local devices	local devices	local devices	local devices, networks*	local and multimedia devices*	local devices*

**Preliminary; may change as market develops.*

Tuned In to Fiber

The SCSI-3 protocol that's generating the most excitement in the high-end Mac storage world is Fiber Channel. While Ultra SCSI provides a solid performance boost using tried-and-true, but potentially finicky, methods, Fiber Channel promises a quantum leap in transfer rates. It does so by taking advantage of the high clock speeds that serial buses can use reliably.

Fiber Channel's name implies the use of fiber-optic cables, and indeed, the Fiber Channel standard supports them. But Fiber Channel also supports good old copper wires, including twisted-pair (telephone-like) and coaxial cabling.

Fiber Channel's promises are enticing: support for copper cables up to 100m long and fiber cables up to 10km long. No address switches or terminators to configure. Hot-pluggable devices—up to 127 of them per bus. And data-transfer rates of up to 100 MBps.

Fiber Channel supports several topologies—or methods of connecting devices to each other—but the one most likely to surface in the personal computer world is called Fiber Channel–Arbitrated Loop, or FC-AL. In the FC-AL topology, the devices on the bus are connected in a circle and talk to each other to determine which one can transmit data on the bus at a given time—hence the phrase "arbitrated loop."

The main players in the FC-AL storage market are Quantum, Seagate, and Hewlett-Packard. Quantum plans to ship Fiber Channel drives by year's end. Seagate will ship a Fiber Channel version of its Barracuda 4 drive by the time you read this, while HP anticipates delivering Fiber Channel drives by early next year.

It's worth noting that, unlike the other protocols discussed in this article (except SSA), Fiber Channel can also be used as a very fast networking medium. The Fiber Channel specification covers a variety of networking protocols and also allows for proprietary protocols such as AppleTalk. Someday you may be using Fiber Channel to access a fast hard drive and to wire a network for your office, floor, building, or campus. And that network might carry not only E-mail and server traffic, but also video and sound.

IBM's Serial Story

Fiber Channel's primary rival among high-speed serial interfaces is the Serial Storage Architecture, or SSA. Developed by IBM, SSA provides many of the same benefits as Fiber Channel: up to 127 devices per bus, automatic device configuration, and hot-pluggability. SSA's maximum data-transfer rates are somewhat slower, however—up to 80 MBps (double-speed SSA, for 160 MBps, is in the works). SSA devices use simple 9-pin connectors and inexpensive 6-wire cables, and they usually use 2 ports, requiring a pair of cables.

SSA may become important for Windows and for minicomputer and mainframe disk arrays, but it remains to be seen how large a player SSA will be in the Macintosh world. No vendors have announced plans for a Mac version of SSA, and the main drive makers in the SSA camp—among them, IBM, Micropolis, and Conner Peripherals—have a lower profile in the high-end Mac storage world than do Seagate and Quantum.

Apple's Fiery Wire

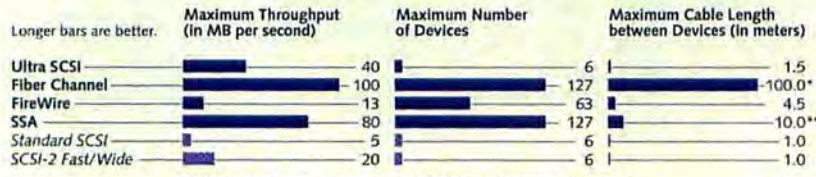
Then there's FireWire, also known by the less catchy name P1394, the preliminary specification on which FireWire is based. The initial FireWire spec allows for data-transfer rates of up to 12.5 MBps (faster versions will be available later) over inexpensive 9-pin cables. The cables use heavy-duty connectors, similar to those used on home video games, that are designed to withstand repeated plugging and unplugging. FireWire supports up to 63 hot-pluggable devices on a bus; cables between devices can be up to 4.5m long.

Originally touted as a SCSI replacement for hard drives and other storage devices, FireWire is evolving into an interface for multimedia devices such as video cameras, digital still cameras, and videocassette recorders. Indeed, Apple's implementation of FireWire places special emphasis on isochronous—real-time—data, such as video feeds and audio. (Sony has announced plans to build FireWire connectors into forthcoming digital-video cameras.) In the storage world, IBM, Maxtor, Western Digital, and Adaptec have demonstrated FireWire drives or interfaces, but none have committed to shipping FireWire products.

FireWire doesn't allow for the sizzling transfer rates or kilometer-class cable lengths of Fiber Channel, but with relatively inexpensive controllers and widespread use in consumer electronics, FireWire is likely to be simpler and less expensive than other implementations of SCSI-3. If, as has been rumored, Apple ships a FireWire interface card for PCI

How Well Do SCSI Variants Connect?

The four variants of SCSI-3 offer different speed levels, handle different numbers of devices, and have different cable-length limits. These differences are key to understanding which technology will best fit your work environment. Unknown yet is what variants developers will ultimately offer specific products for.



**10,000m (10km) over fiber cable. **1000m (1km) over fiber cable.*

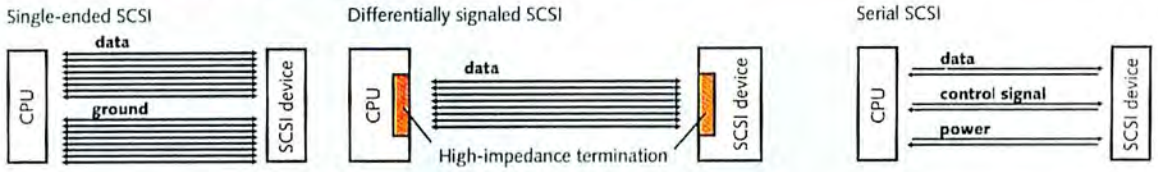
What Makes SCSI-3 So Fast?

The fundamental difference between older SCSI standards and most implementations of the new SCSI-3 is the switch from a parallel architecture (several pairs of lines carrying data side by side) to a serial one (one pair of lines carrying data). The electronics that control and interpret data flow have become so fast that the electrical noise and cross talk created by multiple lines have become the limiting factors on throughput; one pair of lines can operate at very high speeds with no noise, thus providing greater throughput than 8 or even 16 lines operating slowly enough to keep noise in check.

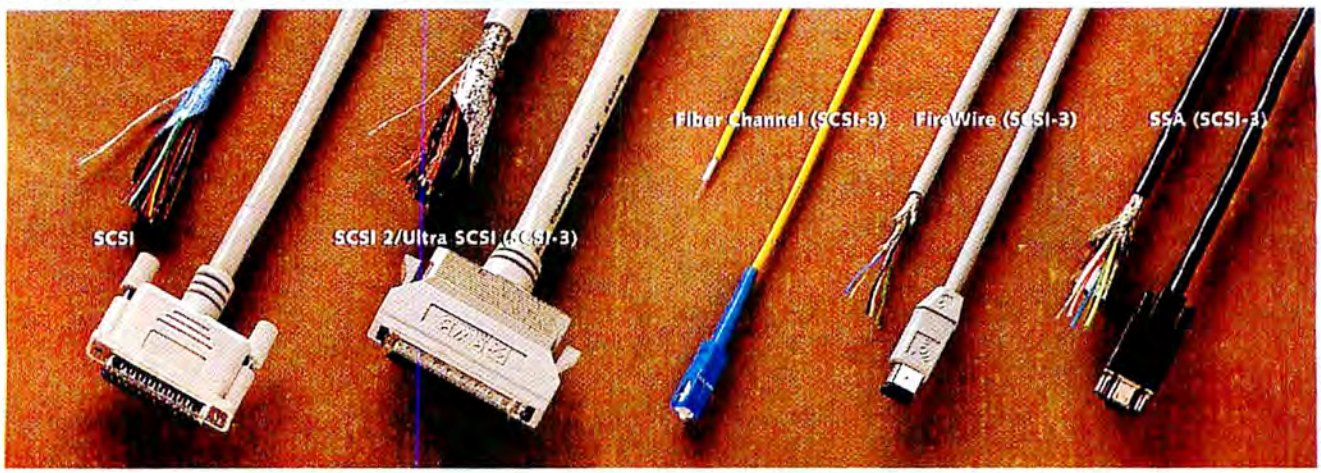
Parallel versus Serial

A parallel interface can use lines in different ways. The standard single-ended SCSI uses eight separate data lines and ground wires (though the separate grounds function as a single wire), which makes the system especially vulnerable to noise. Another, more expensive scheme, *differential signaling*, eliminates cross talk as well as any need for grounding by using high-impedance termination for the CPU and SCSI device. Each method uses additional lines for power and control signals.

A serial interface normally uses six lines—one in each direction for data, the control signal, and power.



Comparing Parallel and Serial Connectors



Standard SCSI uses a 50-pin connector, but uses only a total of 25 lines, including 8 each for data and grounding. It permits a maximum throughput of 5 MBps.

Ultra SCSI (also called Fast 20 or Fast 40) uses the same wiring scheme as SCSI-2 Fast/Wide but doubles the clock rate, boosting throughput to 40 MBps. (**SCSI-2** Fast/Wide supports 32 data lines, though most implementations use only 16, with a maximum throughput of 20 MBps.) Ultra SCSI's increased noise potential limits systems that don't use high-impedance termination to using very short cables.

Fiber Channel can run over copper, twisted-pair, or fiber-optic lines, and support throughput of 100 MBps. *Arbitrated loop*, a fiber-channel topology, reduces the number of expensive host connections by sharing host interfaces among several devices.

FireWire tops out at 12.5 MBps in early implementations—fast enough for its likely use as an interface to multimedia devices. Note the easily manipulated connector, designed to be inserted and removed thousands of times.

Serial Storage Architecture (SSA) operates at 20 to 80 MBps in its first implementation, though it can achieve top speeds only with specially configured systems. SSA's topology does not require arbitration—that is, multiple devices can send packets at the same time, without making sure the line is free.

Macs and Windows machines, and if enough FireWire-equipped devices become available to make the card worth buying, then drive manufacturers might be enticed into building FireWire-based mechanisms. If not, don't expect to see FireWire affecting the storage world.

The Last Word

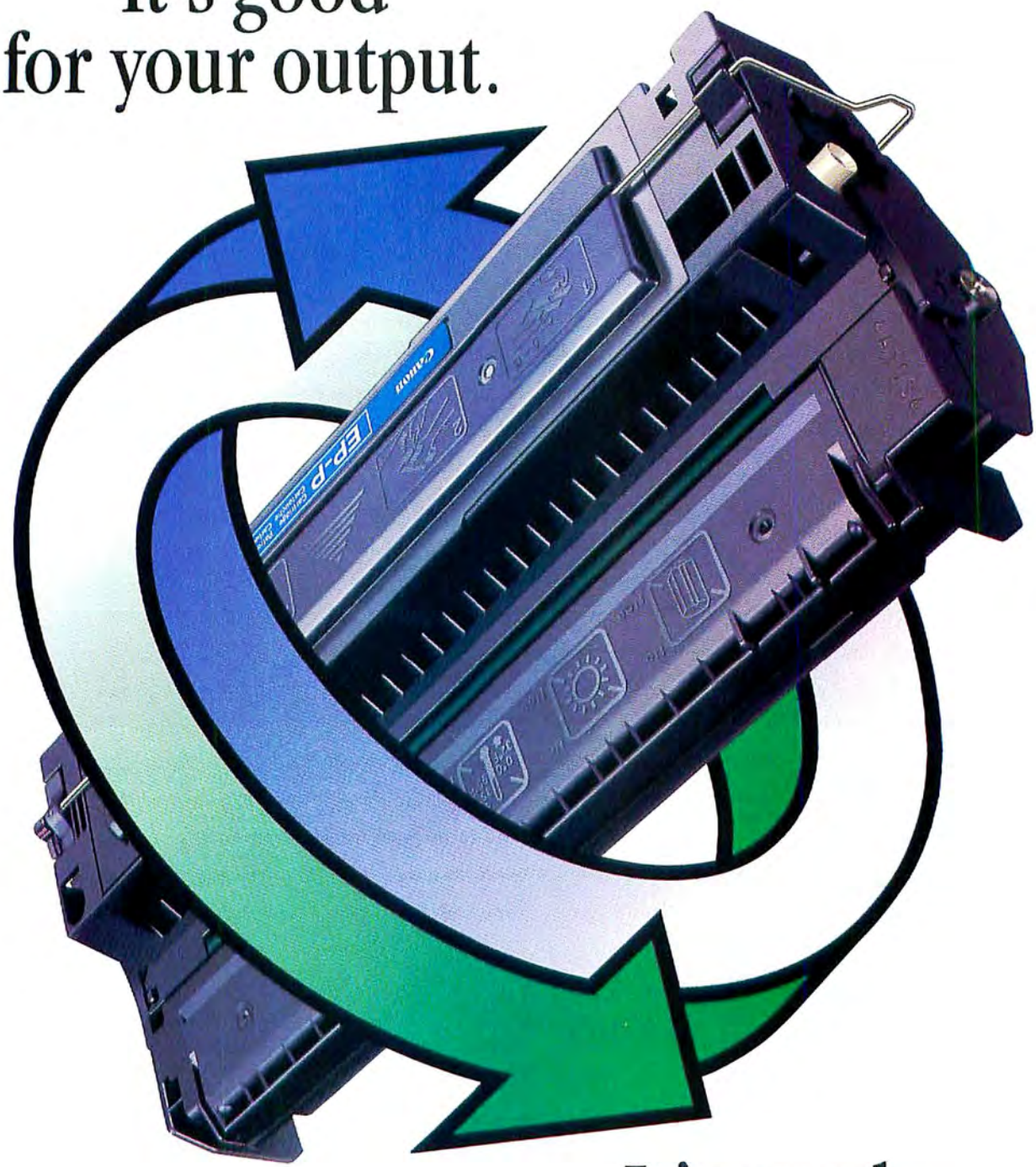
In the near future, the only storage products that will be able to take full advantage of the new buses are disk arrays—today's drive mechanisms just aren't fast enough. But 20-MBps drives may soon be commonplace. With this in mind, it looks like Ultra SCSI is the near-term option for a high-speed interface, with Fiber Channel taking the torch later this year or early next. (FWB has already announced that it will ship Ultra SCSI and Fiber Channel versions of its JackHammer interfaces and SledgeHammer arrays.)

Is it worth considering an Ultra SCSI–based system when Fiber Channel is just over the horizon? By all means—if you work in a cost- and data-intensive field, such as color publishing or video production, and need maximum performance *now*, not late this year or next year. More to the point, SCSI-2 Fast and Wide products are available now and they work. The SCSI-3 protocols are impressive, but they're just making the journey from drawing board to desktop, and that can be a long road with real potential for detours and expensive mistakes. **m**

Contributing editor JIM HEID has been covering Macintosh technology since November 1983. His latest book, *Macworld Complete Mac Handbook Plus Interactive CD*, third edition (IDG Books Worldwide, 1994), recently won a BMUG Choice award for best general Macintosh book.

Research assistance by MATTHEW LEEDS.

It's good for your output.



It's good for your world.

Cartridges returned via:

UPS® MBE® MAIL BOXES ETC.®

Call 1-800-962-2708 for Detail.

All registered trademarks belong to their respective holders.

CANON INC. 30-2, Shimomaruko 3-chome, Ohta-ku, Tokyo 146, Japan. ©1995 Canon Inc.

The Canon Cartridge. In laser beam printers, personal copiers and plain paper fax machines, it's the heart of the desktop publishing revolution that's transformed homes and offices around the globe.

The key components of the imaging mechanism are combined with the toner in an all-in-one cartridge so simple to replace that anyone can do it. Replacing the cartridge ensures the highest output quality. It also makes your equipment virtually maintenance free. It's clean as well as simple, too; so there's no need to dirty your hands.

Please return your spent Canon cartridges.

For output quality and operating convenience, no other system comes close. And here's the point we'd like to emphasize — when the cartridge is returned to Canon, the environment is benefited because landfill waste is reduced.

When returned to Canon, cartridges are carefully disassembled. Reusable parts are painstakingly screened and cleaned. Over 95 % by weight of collected cartridges' parts and materials are used in making cartridges or other products. The result: It's good for you. It's also good for the earth. Return your Canon cartridges when they are of no further use. Please.

As part of our Clean Earth Campaign in the United States, Canon makes donations to charitable organizations dedicated to environmental issues. Used cartridges are returned under the Clean Earth Campaign via the United Parcel Service (UPS) or Mail Boxes Etc. Shipping costs are paid by Canon, so there's no charge to our customers. Easy shipping instructions can be found in the cartridge box.

For your home or office, choose any of the wide range of products that use Canon cartridges.

Laser Beam Printer LBP-1260

Personal Copier PC320

Electronic Filing System Canofile 510

Fax Laser Class 5000

Canon

Circle 109 on reader service card

EDITED BY CATHY ABES

Graphics

THE LATEST IN DESIGN, PUBLISHING, AND PREPRESS

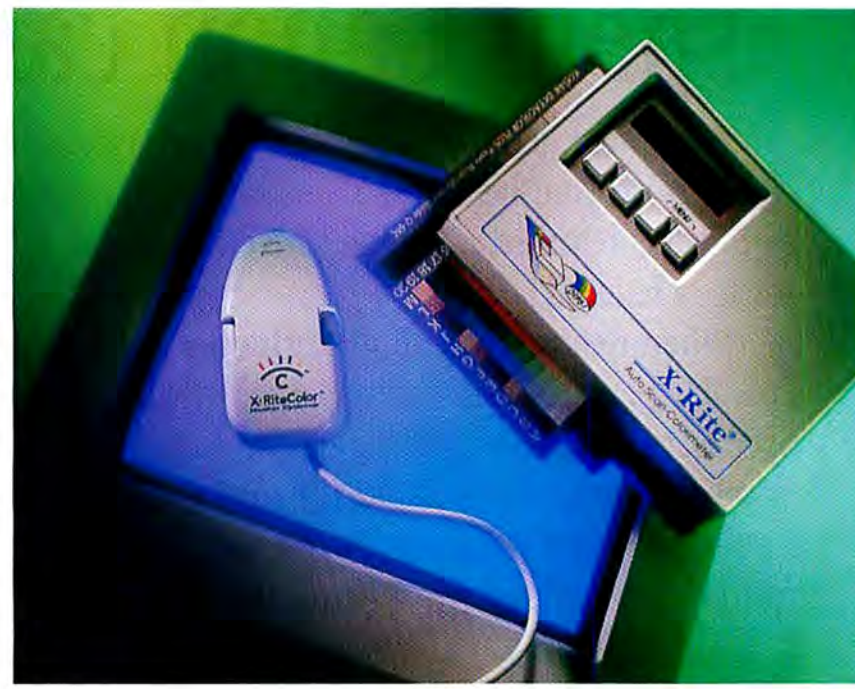
Color Calibration in a New Light

COINCIDING WITH COLORSYNC 2.0'S debut at the Seybold Conference in late March, color-calibration tools are starting to support Apple's revamped color-management architecture. Once the major graphics applications have incorporated support for ColorSync's ICC device profiles, these profiles should be able to move seamlessly between applications and platforms. Eventually, achieving color consistency across the board should become easier and more transparent to users—most of whom have been put off by the complexity and lack of industrywide consistency of color-management systems (see "The Color You Expect," *Macworld*, May 1995).

Color Solutions' ColorBlind Color Management System lets you generate customized ICC profiles of all your input and output devices—including monitors, scanners, digital cameras, Photo CDs, printers, presses, and proofing systems. Measuring scanned IT8 targets with a colorimeter, ColorBlind characterizes your devices, builds a custom profile for each, and links them together.

For $8500, you get the complete system, consisting of X-Rite's DTP51 Autoscan Colorimeter, the ColorBlind application, an Adobe Photoshop plug-in filter, a CMYK Photoshop Export Module, a batch processing application, a profile manager, and generic profiles. ColorBlind Filters—a bundle of the Photoshop filter, export module, profile manager, and profiles—costs $650; ColorBlind Scan (for scanner calibration only), plus the filter bundle and a generic profile for output devices is $1300; and the batch processor sells separately for $1000.

Candela's ColorSynergy (available from Color Partnership) is a $495 software-only calibration package that generates ICC-compatible color profiles and lets Photoshop users export printer profiles created with ColorSynergy as Color Separation Tables. After scanning an IT8 target, you point to several reference marks on screen to calibrate the scanner. Next, you print out the target and scan it back in to create your printer profile. To calibrate your monitor, you select the appropriate phosphor primaries from ColorSynergy's database, or you can enter custom values if they're available.



KEVIN CANDLAND

X-Rite has introduced the X-RiteColor Monitor Optimizer, an $895 CIE-based colorimeter; and X-RiteColor Scanner Enhancer, software that calibrates your scanner using an IT8 target. Both products let you create customized device profiles.

Color Partnership, 800/554-8688; Color Solutions, 619/436-6593; X-Rite, 616/534-7663.—C.A.

Multimedia for Artists

MULTIMEDIA AUTHORING tools typically require artists to spend more time programming than creating content. mTropolis, a $3995 multimedia package from mFactory, aims to free artists from programming drudgery, without limiting their interactive ambitions. And the program's open framework allows in-house developers to easily integrate new technologies—such as improved 3-D–rendering engines and new online design tools.

Like most authoring tools, the object-oriented mTropolis lets you attach behav-

iors such as coloring and motion to specific objects in a scene and define object interactions. But you don't have to write complex scripts to do it. You can even drag and drop one object's settings onto another object.

mFactory says a multithreaded kernel lets the program run on low-end machines, such as a 68020 Mac with 8MB of RAM, and allows multiple content creators to work simultaneously on the same media. mTropolis tracks a project's media and files throughout the development process and can build applications for both Mac and Windows machines.

mTropolis is expected to ship by the end of June with a smart installer for both 680X0 Macs and Power Macs. mFactory, 415/548-0600.—JIM FEELEY

mTropolis lets artists design multimedia content—such as assigning behaviors to these chess pieces—without doing complex scripting.

More Layers of Painter

ALTHOUGH FRACTAL DESIGN MANaged to cram a slew of new features into Painter 3.0 by the time it shipped last fall, the company was forced to leave out a few things—such as multiple undo, Photoshop 3 and GIF support, and some new effects. Now 3.1, shipping in April, corrects those omissions.

Multiple undo defaults to 5 levels but can be set to as many as 32. The new Gradation Editor lets you design gradations

Among Painter 3.1's new features are a fractal generator, gradation editing, and new texture controls.

and alter existing ones. Express Texture simulates a custom halftone screen effect with built-in antialiasing, while the improved Apply Surface Texture allows for multiple light sources and greater interaction between light and paper grain.

You can now convert between Photoshop layers and Painter floaters and save GIF images for use on the Internet's World Wide Web.

The upgrade is free online to 3.0 owners ($12.95 on disk), $99 for X2 owners, and $149 for 1.X and 2.0 owners. Fractal Design, 408/688-5300.—C.A.

New Life for QuickDraw GX

BUG-FIXES, NEW FEATURES, AND glimmers of new developer support are breathing some life into QuickDraw GX 1.1.1, part of the free System 7.5 Update 1.0 (see "System 7.5 Update Causes Conflicts," *News*, in this issue). Beyond its greater stability and faster printing, the new version of Apple's imaging engine has added features—such as EPS support and the ability to print up to 16 pages on one sheet—accessible even within non-GX-savvy applications. And though makers of publishing programs still seem put off by GX's stiff RAM requirements, bugs, and absence of cross-platform support, multimedia developers like Radius and Pixar are extolling its virtues.

Pixar says GX has enabled Typestry 2.1 users to create improved ligatures, swash caps, and other typographic embellishments. Radius uses GX to drive the title generator in its video editor, RadiusEdit, making it possible to create text and graphic objects with smooth antialiasing, motion, and rotation, and to change the shape of type over time. But type developers must first build GX typefaces that RadiusEdit can manipulate. However, Apple expects more than 250 type and application developers to add GX support this year. QuickDraw GX 1.1.1 is available free online or for $10 from Apple. 408/996-1010.—JIM FEELEY

IN BRIEF

PostScript Toolbox TechPool Software's Transverter Pro 2.1 ($395) lets you convert, place, and view PostScript files from any source for editing within Photoshop, FreeHand, Illustrator, or Canvas. You can convert any PostScript file to EPS and place it in QuarkXPress or PageMaker. Transverter Pro also rasterizes PostScript Level 2 files to TIFF and adds screen previews to EPS images. The upgrade from 2.0 is $50; $99 for 1.X users. 216/382-1234.

High-End Masking Scitex America has two high-end masking tools—MaskCutter ($850, for PostScript only, due in June) and MaskCutter Pro ($2000, for PostScript and Scitex, available now). MaskCutter automatically detects edges along a specified contour and lets you isolate areas and then add to or delete from them to mask complex objects. 617/275-5150, 800/929-9209.

A Tablet You Can Roll Up

HAVE YOU EVER WANTED A FLEXIBLE digitizer that you could literally roll up and carry away? SummaGraphics claims the SummaFlex is the first flexible, cordless, pressure-sensitive tablet designed for graphic artists. With a soft surface that's roughly ¼-inch thick and an active area of 18 by 24 inches, the 24-by-30-inch SummaFlex lets you switch between small and full-size work areas.

You can customize the tablet's operations by assigning them to various feature and function keys. Functions include modifying pressure output, adjusting pressure response, entering manual pressure mode, scaling tablet and screen areas, and executing macros.

SCOTT PETERSON

Although SummaGraphics recommends storing the tablet flat—particularly in extreme temperatures—it can be rolled up for transporting. Due by mid-May, the SummaFlex will retail for $849. SummaGraphics, 512/835-0900.—C.A.

Expert Graphics

GRAPHICS PROFESSIONALS SHARE THEIR SECRETS

by Cathy Abes

Artist: Dorothy Krause is a professor of computer graphics at the Massachusetts College of Art and corporate curator for Iris Graphics. Her work has been featured in numerous shows, including Digital Masters, Fractal Design's Art Expo, and Adobe's Digital Art Show.

How It Was Done: Part of a series of images Krause calls "Transcending Reality: Wishes, Lies and Dreams," *Angel on My Shoulder* was composited from four scanned images: a Renaissance portrait; a clip-art figure; a frame; and a photograph by artist and photographer Jan Doucette.

In Photoshop 3.0, Krause used Levels to brighten the washed-out Renaissance portrait. After using Levels and Hue/Saturation to give the figure a sepia tone, Krause applied a 1-pixel Gaussian Blur to soften the edges. She then applied Unsharp Mask twice at 50 percent with a 0.5-pixel radius and 0 tolerance to restore the crisp contrast of the edges.

After pasting the clip-art angel into the Renaissance portrait and enlarging it to fit, Krause chose Darken from the Layers menu at 100 percent opacity so only the sepia remained.

Using Levels and Hue/Saturation to brighten the frame, Krause boosted the red band's saturation to +48 and reduced its lightness to –39. With the magic wand set to a tolerance of 45, she selected the areas on each side of the red band to create a ragged edge. She then painted the yellow areas bright green with the airbrush in Multiply mode. After deleting the unwanted parts, she pasted the frame into the portrait and resized it to fit.

After pasting the wood nymph into the portrait, Krause applied a KPT metallic gold blend to the original nymph, and boosted the contrast with Curves. Then she pasted that image over the unmanipulated one at 75 percent opacity using Multiply for an iridescent glow.

Finally, in Painter Krause selected the resized frame as the clone source and used the Watercolor cloner to make the frame show through the nymph's gown to make it appear transparent. m

1 The original scan of the Renaissance portrait before Krause boosted the saturation and contrast by changing the input levels to 56, 1.00, and 190.

2 The original clip-art figure (from Zedcor's Desk Gallery Clip Art Library) that would become the angel.

3 The figure after Krause reduced Output Levels to 128 and 255 to change the black to a medium gray, then colorized it and changed the hue to 32 and the saturation to 59 to give it a sepia tone.

THE TOOLS

Hardware: Quadra 700 with 20MB of RAM and a 1.3GB Seagate internal hard drive; NuDesign 200/88/44MB SyQuest removable-cartridge drive; SuperMac 20" monitor; NEC 14" MultiSync 3D monitor; PowerUser triple-speed CD-ROM drive; HP DeskWriter 550C printer; Umax UC630 color scanner; Wacom SD-510C pressure-sensitive tablet.

Software: Adobe Photoshop 3.0; Fractal Design Painter 3.0; Kai's Power Tools 2.0.

4 A detail of the original frame Krause scanned, taken from a medieval illustration of an astrological sign.

5 The frame after Krause increased the saturation and contrast by changing the input levels to 14, 1.00, and 149; changed the red band's saturation to +48 and lightness to –39; created an uneven edge; and painted the yellow areas green.

6 The original scanned photo of the wood nymph, one of a series of photographs by Jan Doucette.

7 The wood nymph after Krause applied KPT Gradient Designer using the Metallic preset called Gentle Gold Sweep with the Procedural Blend option selected.

EDITED BY CAMERON CROTTY

At Work

THE LATEST TOOLS FOR BUSINESS COMPUTING

Getting Your Feet Wet on the Net

THE INTERNET IS ALREADY THE hottest topic of 1995, and the pressure to connect your business seems almost palpable. But you don't have to spend thousands of dollars on complicated equipment and high-speed digital connections. Low-cost options abound, and some vendors are building service packages designed to hook up small and midsize companies easily and inexpensively.

WILL CROCKER

Exploring the Territory

The best advice for any business connecting to the Internet is to start small and simple with an E-mail address—a commodity you can get for a few dollars a month from online services like America Online and CompuServe, which have easy-to-use interfaces and gentle learning curves. Many online services also have special-interest forums where businesspeople can meet and exchange ideas (**Go: Internet Forums** on CompuServe, **Jump: Your Business BB** on Prodigy).

The downside of using an online service is that none currently provide access for Mac clients to the World Wide Web, where some of the most exciting and rapid growth is occurring. If you don't mind the extra jargon, Web access is worth the slightly higher price of a dial-up connection to an Internet Service Provider (ISP) via SLIP or PPP. PSINet (703/904-4100), an ISP with a high-speed nationwide network backbone, has recently reduced its registration fee to $9 and its hourly dial-up charges to $1.50 for each hour over each user's 9-hour monthly allotment (plus a onetime $50 charge for the connection software). There are hundreds of ISPs nationwide; some focus on service to local customers, while others, like PSINet, have access points in many cities. Netcom (408/983-5950) and Information Access Technologies (510/704-0160) are other well-known ISPs with national reach; a computer consultant near you can recommend a local service provider with Mac know-how.

If you want Internet access for several workers on a LAN but don't want the support difficulties of a full-blown in-house Net server, you should consider a hardware/service package in which an ISP handles the messy administration. The WorldWire bundle (available from Compatible Systems and InterCon) lists for $1695 and includes a Compatible Systems MicroRouter 900i IP router, a five-user license for InterCon's TCP/Connect II version 2.1, and credit toward service on a participating ISP. You plug the MicroRouter into an Ethernet network and equip it with a modem, and everyone on your network with the appropriate client software can send and receive E-mail and access Internet services, including the Web. Global Village (408/523-1000) provides a similar solution with its $1995 OneWorld Internet (see *Reviews*, *Macworld*, June 1995). It recently reduced its connect fee to $3.95 per hour, or a monthly flat rate of $249 (plus a $49-a-month E-mail service fee for ten or fewer users in either case)—competitive with online services and ISPs. As a bonus, both packages can mesh with your existing E-mail network, so sending a message across the country is nearly as simple as sending one down the hall. For more details on connecting a LAN to the Net, see "Internet Links for the LAN," in this month's *Networks* news.

A Page of Your Own

Usually the next step is to create your own space on the Net, and the hottest place to be now is the World Wide Web. Again,

this goal can be achieved with a dial-up connection and a relatively small investment; hundreds of ISPs across the nation can set up and maintain a Web page for you. One relatively inexpensive provider is Network Wizards (415/326-2060). For a $100 setup fee and $30 a month, the company will maintain a Web site for you with your own domain name (for example, **http://www.yourcompany.com**). You can store up to 10MB of data on Network Wizards' server, and Net surfers can download up to 100MB of your data per month (10 people can each download 10MB, for instance); after that, you pay for every megabyte downloaded. Of course, you are just renting disk space and network time and expertise—you must provide the HTML Web page and associated files. But Web-page-design consulting is a rapidly growing industry, and if you insist on one-stop shopping, many providers also offer such services; ask a local computer consultant for a recommendation.

For those already online, NetUSA maintains a list of ISPs worldwide at **http://www.netusa.net/ISP/index.html**; Celestin offers a similar list at **http://www.teleport.com/~cci/directories/pocia/pocia.html**, while SenseMedia keeps a list of Pacific-coast providers at **http://sensemedia.net/crisp/crisp**. (See also "Web Design Spins Up," in this month's *News*.)

And this is just the beginning. You may eventually want to put in high-speed data lines and get an in-house server, especially since several companies recently announced Internet server software for the Macintosh (see "Making Macs into Internet Servers," in this month's *Networks* news). But for now, you can dip your feet into the Net without worrying about taking a bath.—C.C.

Color Printers for Workgroups

WANT TO ADD COLOR TO YOUR everyday business printing? Hewlett-Packard, QMS, and Tektronix hope so. All three have introduced printers that let you use color not only in presentations but in ordinary business documents—memos, reports, and the all-important office-party notices.

Many see HP's Color LaserJet as legitimizing the color laser category. The printer is rated at 10 pages per minute for monochrome or 2 ppm for color, but resolution is a relatively coarse 300 dpi. And it isn't cheap: it starts at $7295; PostScript Level 2 and EtherTalk/LocalTalk options list for $799 and $429, respectively.

Though QMS cannot compete in name recognition, it definitely competes in price and features. Its magicolor LX color laser lists for $4999 and includes PostScript Level 2 compatibility, an internal hard drive for font storage and network spooling, and a LocalTalk interface (add $999 for Ethernet). QMS rates the magicolor LX at 12 ppm for monochrome and 3 to 6 ppm for color. The base model prints monochrome at 600 dpi and color at 300 dpi; equip it with 24MB of RAM to get 600-dpi color. Price and availability haven't been announced.

And now for something completely different: the Phaser 340 from Tektronix. Instead of using a laser-imaging mechanism, this machine relies on crayonlike ink sticks that are easier to install and less expensive than color toner cartridges. (The tabloid-size Phaser 300i, popular in the graphics industry, uses a similar technology.) The $4995 Phaser 340 prints up to 4 ppm in color, at 300 by 300 or 600 by 300 dpi. It includes PostScript Level 2 but only a Windows-oriented parallel port; an Ethernet interface lists for $595.

Will businesses shell out five grand or more for a machine that prints only a few color pages per minute when 16-ppm monochrome printers are available for under $2300? Because the new printers are essentially trying to create a whole new market, "they have a tough road ahead," says Marco Boer, an analyst at International Data Corporation (IDC). The real action in the color printer world is in the home/small-business market where, according to IDC, 650,000 Mac-compatible color ink-jets will be sold in 1995, compared with last year's 325,000.

The new workgroup color printers have definite advantages over color ink-jets in output quality and speed, but until prices fall, only deep-pocketed firms may be willing to pay the premium. Hewlett-Packard, 800/752-0900; QMS, 205/633-4300; Tektronix, 503/682-7377.—JIM HEID

IN BRIEF

■ **High-Res Scanning at a Low Price** Hewlett-Packard and Epson are shipping 30-bit, 600-dpi, color desktop scanners with affordable prices. HP's ScanJet 3c includes Adobe Photoshop LE 3.0 and Calera's WordScan 3.1 OCR software; it will list for $1179. Epson's ES-1200C, which will list for $1499, comes with Photoshop 3.0.1 and Kai's Power Tools. Epson, 310/782-0770; Hewlett-Packard, 800/752-0900.

■ **Databases Documented** An excellent summary of Mac client-server database development tools is available on the Net. Author Liam Breck briefly explains client-builder tools, data-access layers, and database servers; he also describes over 30 products in those categories. For a copy, send E-mail to **maccsdb@external.umass.edu**, or find it on the Web at **http://www.astro.nwu.edu/lentz/mac/software/csdb-summary.html**.

Digital Cameras for Business

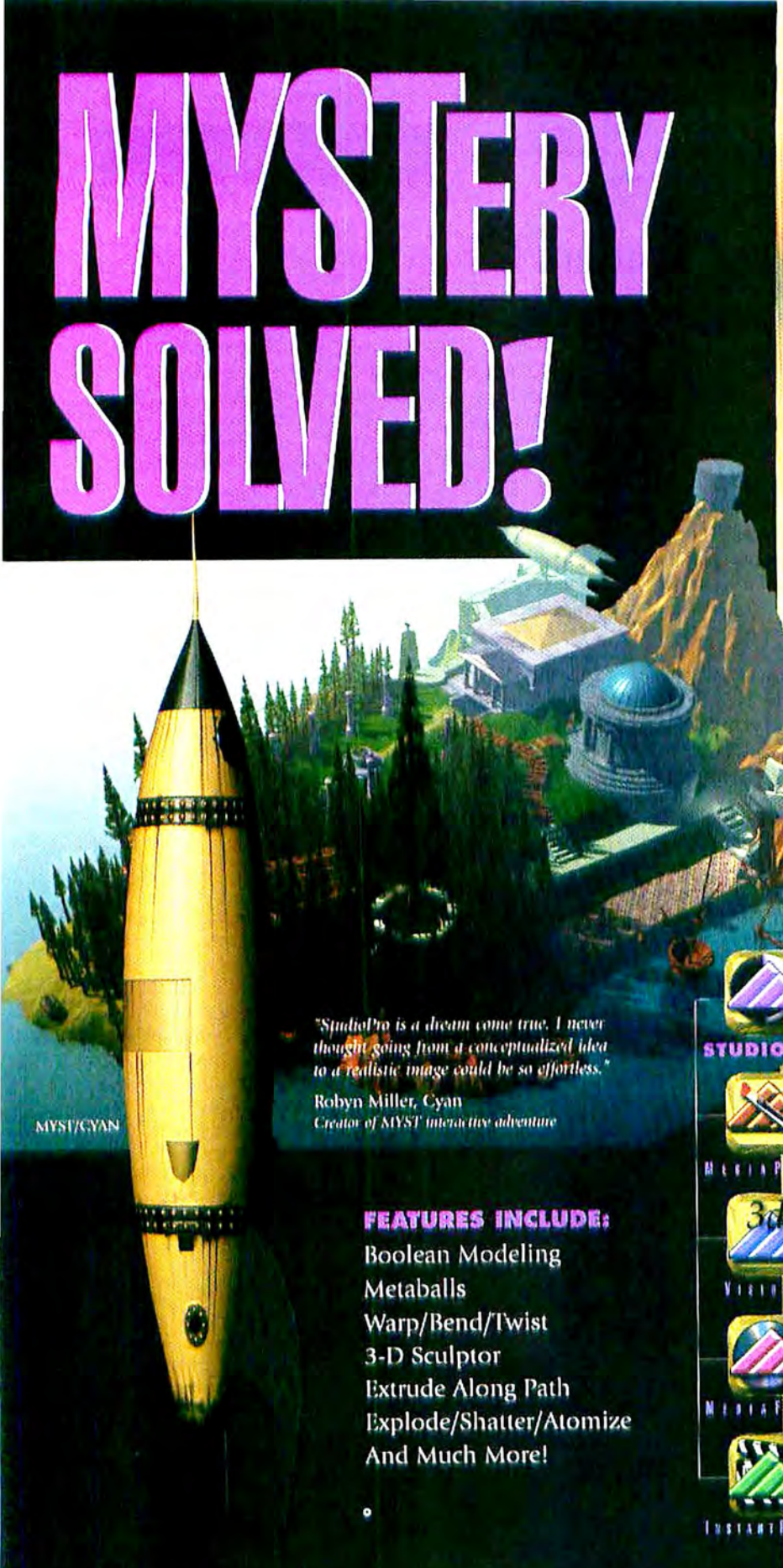
INDUSTRIES LIKE REAL ESTATE and insurance use point-and-shoot 35mm cameras or Polaroid-style instant cameras for documentation. Kodak and Apple are hoping that 24-bit cameras with goof-proof features, retail prices under $1000, and savings on film and development costs will encourage businesses to get the digital picture.

KEVIN CANDLAND

The DC 40 ($995 list), Kodak's first consumer-level digital camera, holds 48 high-res (765-by-504-pixel) images. Users can buy extra lenses from Kodak.

Apple's QuickTake 150, an update to the QuickTake 100, holds 16 high-res (640-by-480-pixel) images and comes with a snap-on lens/flash-diffuser attachment for close-up work. Apple estimates the price at $749. Apple, 408/996-1010; Kodak, 716/726-7260.—C.C.

MYSTERY SOLVED!



MYST/CYAN

"StudioPro is a dream come true. I never thought going from a conceptualized idea to a realistic image could be so effortless."

Robyn Miller, Cyan
Creator of MYST interactive adventure

FEATURES INCLUDE:
Boolean Modeling
Metaballs
Warp/Bend/Twist
3-D Sculptor
Extrude Along Path
Explode/Shatter/Atomize
And Much More!

STRATA™ STUDIO *Pro*

WANT TO UNLOCK THE BEST-KEPT SECRET OF MYST?

The spectacular images in this best-selling game were created on a Macintosh using Strata StudioPro™. With a terrific balance of award-winning modeling, rendering and animation capabilities, our StudioPro 3-D package is used by industry professionals in multimedia, broadcast/film and design to create photorealistic images. And now, with the powerful features of StudioPro 1.5, you can create models that warp, bend, twist or animate over time, then add special effects like Explode, Shatter and Atomize. Just think what the creators of MYST™ could have done with these new features. Discover for yourself—and create your own 3-D world with StudioPro.

STRATA

1-800-STRATA3D

For Academic Pricing, call:
1-800-531-3227

Circle 114 on reader service card

NewMedia Magazine Thumbs Up · MacUser 5 Mice · MW Editors' Choice · DV

StudioPro is a trademark of Strata, Inc. All other trademarks are the property of their respective holders.

BY JIM HEID

Working Smart

Making Slides with Film Recorders

GIVING A BIG PRESENTATION WITHOUT slipping up is hard enough, but using a presentation program's slide-show mode to show your visuals can put you in a minefield of banana peels. Do you schlepp your own Mac to the auditorium and risk forgetting something? If you use someone else's Mac, will the fonts you need be installed? Will the video projector work? What if your system crashes?

One tried-and-true technology eliminates these worries: trusty 35mm slides. Slides don't crash; they're more portable and less breakable than a PowerBook. Slide projectors are easier to find than obscure video-adapter cables. And slides provide richer colors and sharper resolution than a projected Mac screen image.

Most companies use service bureaus to create slides; your presentation package probably included a brochure for a service bureau. But with a desktop film recorder, you can make your own slides (and other photographic output). Most film recorders go for $5000 to $6000—but given that bureaus charge between $10 and $30 per slide, a film recorder can pay for itself if you make a lot of slides.

I tested four film recorders for this column: Polaroid's HR 6000 Digital Palette (which is also available from GCC Technologies [617/275-5800] as the ColorFast II Plus), Lasergraphics' Personal LFR, Montage Graphics' Montage FR2, and Mirus's FilmPrinter Turbo II. To compare my slides with what the experts produce, I also sent my images to a service bureau, San Francisco's ChartMasters (415/421-6591; see the output samples in "Details of Film-Recorder Output").

Film-Recorder Basics

Think of a film recorder as a color printer that produces images on film instead of paper. A film recorder looks like a big bread box. Facing each other inside the box are a high-resolution video tube capable of painting several thousand lines per inch, and a 35mm camera. In between is a wheel bearing red, green, and blue filters. To expose each frame, the film recorder paints three images on the video tube (one each for the slide's red, green, and blue information), rotating the filter wheel in between each one. The colored light shines through a lens onto the film loaded in the camera. After a complete exposure is made, the camera advances the film for the next shot.

Like any printer, a film recorder relies on a Chooser-based driver with its own Page Setup and Print dialog boxes. Tip: Before laying out visuals, specify 35mm slides under Page Setup; if you start with an image size corresponding to the Mac's screen or an overhead transparency, you'll probably have to rework the slides when you switch to the right dimensions.

Three of the four film recorders I tested include QuickDraw-based drivers. The Montage FR2 uses a third-party PostScript driver, Visual Business Systems' Professional Output Manager (POM), which—unlike the others—can create slides from PostScript images. (POM is also available for all units I used and many others.) POM is harder to learn than the other drivers I tested; it requires a copy-protection device, and its manual is a bit rough. But it's the only PostScript film-recorder driver around.

The drivers for Polaroid's HR 6000 Digital Palette are well designed, easy to use, and sport features other drivers lack, including sliders for adjusting the color of each exposure and a button for previewing images before exposing them. Alas, the drivers I tested, version 2.1.2, didn't work on the Power Mac 7100/80, 8100/100, or 8100/110; Polaroid says version 2.1.4, now shipping, fixes the problem.

The Mirus driver is also well designed, and version 3.0.3 runs in native mode on Power Macs. The Polaroid and Lasergraphics drivers run in emulated mode on Power Macs, and POM is also available in a native-mode version.

All the drivers I tested can batch-print a folder of images. Since it takes a few minutes to expose each image, batch-printing is very convenient.

All Mac film recorders connect via the SCSI bus. Of the four I tested, only the Polaroid provides a handy rotary switch for setting the SCSI address. The Montage and Lasergraphics recorders use those infernal DIP switches to set the SCSI address. And the Mirus lacks address switches; you set the address with a control panel, which may require you to disconnect other SCSI devices until the FilmPrinter is set up.

Photo Opportunities

Although generally associated with making 35mm slides, film recorders can produce other types of photographic output, too. They accept standard 35mm film, so you can load any type of film—includ-

continues

ing black-and-white or color print film.

Some films are faster than others—they require less light to record an image. To account for this, film recorder drivers include calibration tables that let you specify the type of film you're using. You can also create your own calibration tables to accommodate your preferences or film for which a table wasn't included.

The machines I tested all include calibration tables for Polaroid's Presentation Chrome slide film. All drivers except Polaroid's also include tables for Kodak's Elite 100 slide film. (Polaroid's driver provides a table for ISO 100 slide film without mentioning Kodak by name.) All drivers also support several Polaroid instant slide films, including PolaChrome, which produces high-contrast images and is ideal for title slides; PolaBlue, whose white-on-blue images are meant for simple title slides and line art, such as diagrams and architectural drawings; and the black-and-white PolaPan.

Instant slide film requires a Polaroid AutoProcessor; this $162 gizmo is about the size of a small telephone and develops film—no darkroom needed. Polaroid's $52.40 Illuminated Slide Mounter simplifies mounting the developed film in standard slide mounts. Processing and mounting instant slides may sound time-consuming, but it's faster than waiting hours or days for a photofinisher. Don't expect express service from the two-hour processing joint around the corner—most offer two-hour service for print film only. For rush jobs, you may have to rely on a professional color lab.

You can replace the film recorder's 35mm camera back with a sheet-film adapter. This enables you to use professional 4-by-5-inch sheet film as well as Polaroid's 669 Instant Pack film for making instant prints—handy for proofing your visuals before exposing film. Polaroid also offers a 4-by-5-inch instant transparency film called 691 Overhead Projection Instant Pack film. With Polaroid's $199 Overhead Enlarger, you can project these transparencies using a standard overhead projector.

Sliding Home

Should you buy a film recorder or just use a service bureau? If you make slides only occasionally, use a bureau. The results are consistently excellent and you don't have to worry about loading film or dealing with finicky drivers.

Service bureaus can be costly, however. ChartMasters, the bureau I used, charges $9.50 per slide for two-day service and $32 per slide for 2-to-4-hour service. After creating less than 200 slides at $32 each, you will have spent about what a film recorder costs. And you will probably have waited longer than if you owned a machine and used instant slide film or even rush film processing.

If you're ready to buy, I recommend the Polaroid HR 6000 Digital Palette or the Lasergraphics Personal LFR—both produced sharp, good-looking results. Of the two, I put the Polaroid in first place. **m**

Next month: Using DOS media

Contributing editor JIM HEID's *Macworld Complete Mac Handbook Plus Interactive CD*, third edition (IDG Books Worldwide, 1994), recently won the BMUG Choice award for best general Macintosh book.

DETAILS OF FILM-RECORDER OUTPUT

These sample images produced by a service bureau and by four film recorders show a wide range in color quality, sharpness, and image accuracy. In each case I used the driver software's default settings—after all, in a crunch you might not have days to shoot several test rolls and tweak exposure settings. With enough time, color balance and exposure can be corrected, but some errors cannot.

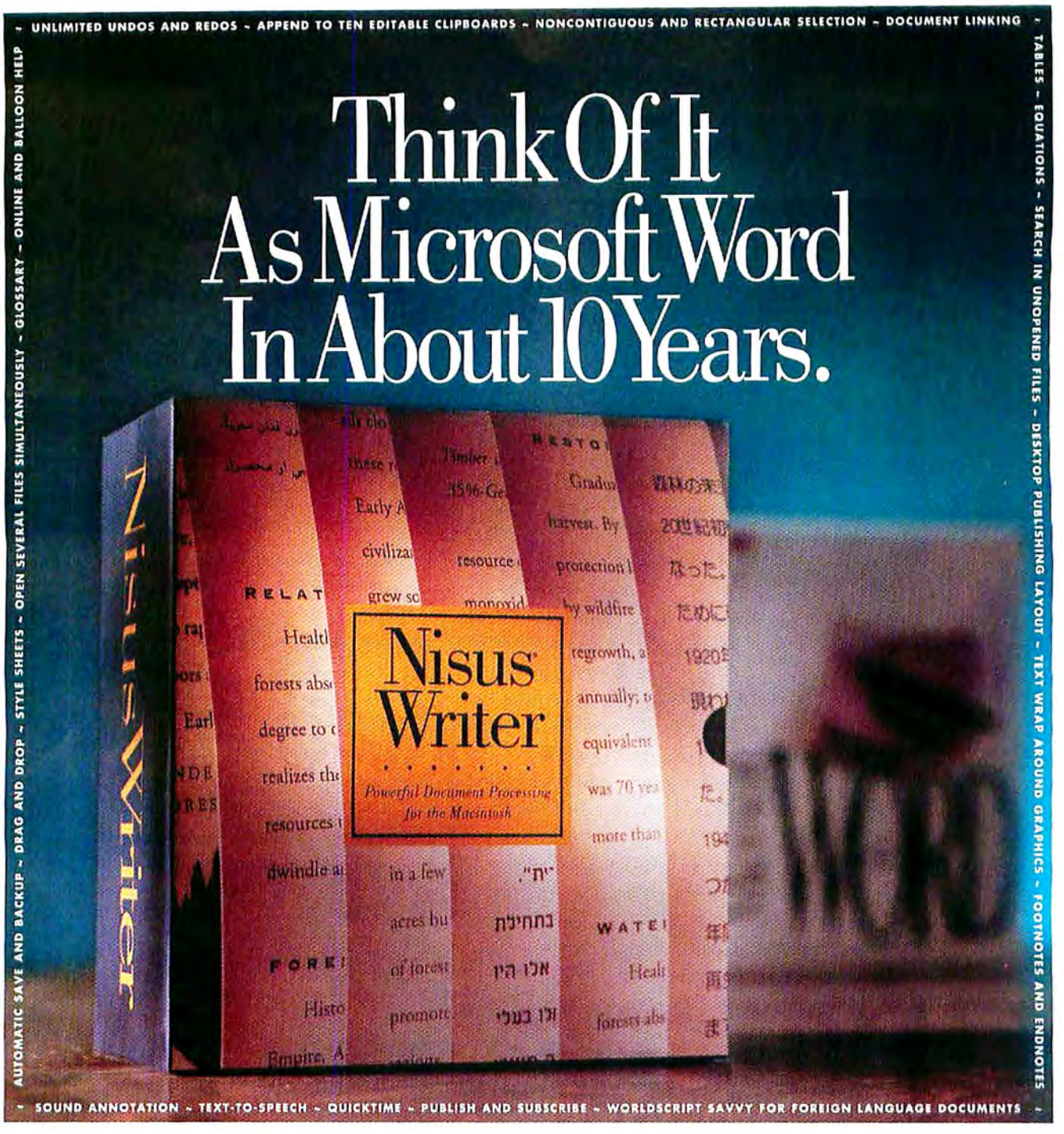
Polaroid HR 6000 Digital Palette Sharpness and resolution are excellent, but the image has a yellowish cast. The background blend and the embossed *S* are somewhat dark, and a narrow white stroke appeared around the yellow text where *Exploring* overlaps the large blue *S*. The recorder also added a thin white line at the image's top and left edges (not shown).

Mirus FilmPrinter Turbo II This machine imaged the photograph more accurately than did the Montage and Polaroid film printers, but the blue portions of the embossed *S* and the background are a bit dark. Sharpness and resolution are excellent—the paired horizontal lines are clear—but a white stroke surrounds *Exploring* where it overlaps the large blue *S*.

Montage FR2 The slide is somewhat washed-out, and the paired horizontal lines have merged. A white stroke surrounds the type at the bottom of the image (not shown) and the word *Exploring* where it overlaps the large blue *S*. The yellow is washed out where the overlap occurs. The recorded image was also crooked.

Lasergraphics Personal LFR Sharpness is excellent and the background blend looks terrific, but the photograph is a bit washed out compared with the others. Also, the recorded image was slightly crooked.

Service Bureau The service bureau–produced slide looks great. Although the background blend and embossed *S* are a bit on the dark side, the image evinces none of the mysterious white knockout affecting most of the homemade slides. (Courtesy of ChartMasters, San Francisco)



Sure, Word's impressive. But it's no Nisus Writer. By giving you the power to manipulate text in multimedia presentations, edit lengthy books, and create foreign language documents, Nisus Writer starts where ordinary Mac word processors stop. Of course, just because it's big on features doesn't mean it's big on memory requirements. At just 2 MB of RAM, Nisus Writer lets you spend less time waiting and more time writing. No wonder why critics are calling Nisus Writer the ultimate document processor. And why a lot of people are calling those other word processors yesterday's news.

The Mac Zone

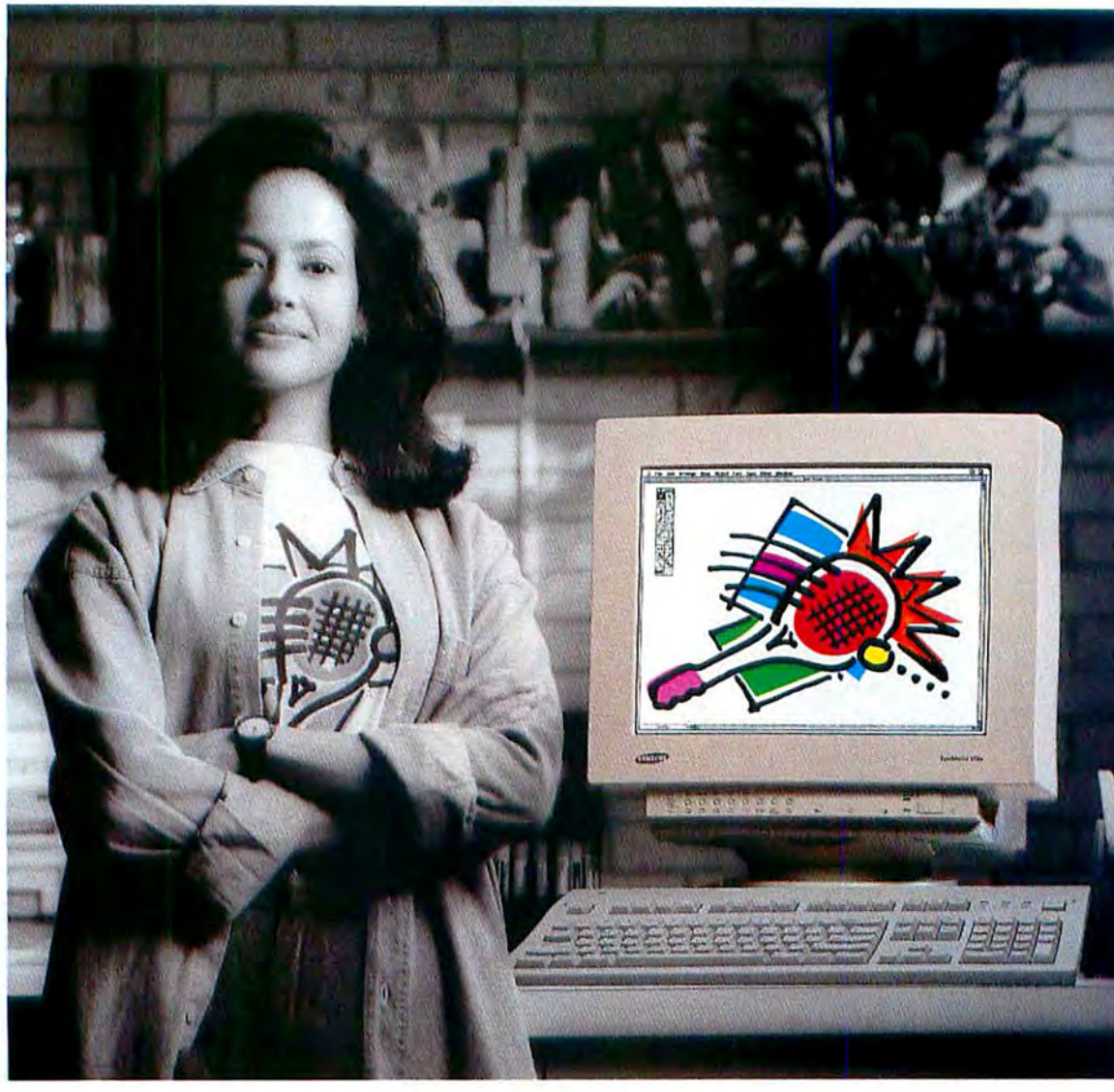
800-436-0606
Source Code #2693

NISUS
Software Inc.

TO RECEIVE A BROCHURE CALL 800-647-8794, OR FOR 24 HOUR IMMEDIATE FAX RESPONSE CALL 619-481-4366.

Nisus and Nisus Writer are registered trademarks of Nisus Software, Inc. All other product names are the registered trademarks of their respective holders.
Nisus Software Inc. - 107 S.Cedros Ave. - Solana Beach, CA 92075 (619) 481-1477, FAX (619) 481-6154.

Samsung.
Mac's new point of view.



SyncMaster 17GLs

It's about how you work on your Mac. Attitude. Satisfaction. Pride. Samsung designed the SyncMaster™ GL Series to be an extension of your creativity.

Whether you design on a Quadra workstation, create multimedia presentations on a Power Macintosh or need external video for your PowerBook, the SyncMaster GL Series will improve the way you view your work.

SyncMaster	14GL	15GL	17GL	17GLs
CRT Size	14"	15"	17"	17"
Dot Pitch	.28	.28	.28	.26
Maximum Resolution	1024x768	1024x768	1024x768	1152x870
Maximum Refresh Rate at Maximum Res. (Hz)	75	75	75	75
MPR-II (Low Radiation)	•	•	•	•
Power Management	•	•	•	•
Flat Square Screen		•	•	•
On-Screen Programming			•	•
Real Color Control				•
Warranty	2 Years	2 Years	2 Years	2 Years

©1994 Samsung Electronics America Inc. Image on SyncMaster 17GLs courtesy of Mike Quon Design Office. Adaptor required for Macintosh Compatibility. Macintosh is a registered trademark and PowerBook, Power Macintosh and Quadra are trademarks of Apple Computer, Inc.

With true 24-bit color, multiple on-the-fly resolutions and on-board color control, you can easily concentrate on what you're doing – not on what's running it.

Think about how you work on your Mac. Samsung did. And came up with a whole new point of view.

For more product information, call 1-800-933-4110.

TECHNOLOGY THAT WORKS FOR LIFE

SAMSUNG ELECTRONICS

Now available at MacMall. ***To order direct call 1-800-222-2808.***

Circle 198 on reader service card

BY LON POOLE

Quick Tips

Tips, Tricks, and Shortcuts

ALTHOUGH YOU CAN HAVE APPLESHARE servers and System 7 file-sharing servers mounted automatically at start-up, doing so can really slow down network performance (especially if everyone on the network does it). To reduce network traffic, *Macworld*'s editorial production manager, Jeff Sacilotto, suggests creating a QuicKeys macro that uses the Mounty function (a QuicKeys extension) to mount a network volume when you need it. Filling in the Mounty dialog box is easy, but you need to know the exact name of the volume to be mounted. For the best security, don't type your password in the Mounty dialog box; instead set the When Connecting option to have the macro ask for your password.

If you don't have QuicKeys, *Macworld* associate editor Cameron Crotty suggests using aliases to mount network volumes whenever you need them. To set up the aliases, use the Chooser to mount the network volumes. Then select the network volumes and make aliases. Put copies of the aliases on the desktop, in the Apple Menu Items folder, and anywhere else you want quick access to the network volumes. When you open the alias of a network volume, or drag something to the alias, your Mac automatically asks you for a password and then mounts the network volume. Similarly, you can make aliases of folders on network volumes and use those aliases to simplify accessing the original folders on the servers.

Preventing CD Removal

Q. I have an expensive CD-ROM that I share with several other users. Is there some way to configure At Ease or some other security program to prevent guest users from ejecting the CD from the CD-ROM drive?

Robert Forstot
St. Louis, Missouri

A. You can deter, but not prevent, removal of a CD-ROM with System 7's file sharing. First insert the CD and then start file sharing with the Sharing Setup control panel. With file sharing on, users will not be able to eject the CD with the Finder's Put Away command, with the Eject button in an application's save or open dialog box, or by dragging the CD icon to the Trash. The CD will remain secure if it is inserted when you restart or start up after a shutdown, since file sharing starts again automatically (unless you stopped it before restarting or shutting down). This file-sharing trick stops working if you install System 7.5 Update 1.0, which updates the File Sharing Extension to improve file-sharing performance and to allow ejecting CDs without turning off file sharing. To get the old behavior back, simply replace File Sharing Extension 7.6.1 (in the Extensions folder) with version 7.1.1, which comes with System 7.5.

DOUG ROSS

However, anyone savvy enough to stop file sharing can easily circumvent this security scheme. You can use At Ease to deny guest access to the Finder (as described in the At Ease documentation). But At Ease alone doesn't deter CD removal; you need the file-sharing trick to thwart the Eject command that's always in At Ease's Special menu.

Two chinks in this CD armor limit its effectiveness, though they don't make it worthless. For one, poking a straightened paper clip into the tiny hole near the CD loading tray or door releases the CD despite any countermeasures you may have taken with software. You could plug the hole, but then you wouldn't be able to use it in an emergency. The other security breach occurs if someone holds down the mouse button while starting up your computer, suspending start-up. A flashing question mark appears on the screen and enables the eject button on the CD-ROM drive.

Aliases Where You Want Them

Q. I partitioned my Mac's 1GB hard drive to have a 100MB system volume. When I make an alias on the main volume and drag the alias to the system volume, the Finder puts a copy of the alias on the system volume and leaves the original alias on the main drive. Then I have to drag the original alias to the Trash. Is there a key I can press to make the Finder move the alias in one step?

Craig Williams
North Aurora, Illinois

continues

A Even better: you can make an alias exactly where you want it in the first place—no bothersome copying and deleting the alias from the folder of its original item. You can add this functionality to System 7.1 or later by placing Leonard Rosenthal's freeware program AliasDragger in the Extensions folder. Then you can make an alias by pressing the control key and dragging the original item where you want an alias of it. AliasDragger and a host of other alias utilities are available from online services and user-group software libraries.

If you can't get your hands on AliasDragger, but you do have System 7.5, you can create an AppleScript script that makes an alias of items directly on the system volume, which AppleScript calls the startup disk. An easy way to create such a script is by modifying a script that comes with System 7.5.

1. Open System 7.5's Script Editor program (accessible via the Launcher control panel) and use it to open the script named Add Alias to Apple Menu, which is located in the Automated Tasks folder.

2. Use the Save As command to save a copy of the script under another name, such as Add Alias to Startup Disk. Leave the Kind option set to Application so the script is saved as a script application.

3. Near the beginning of the script, the line that begins **if name of (info** contains the name of the script application in quotes. Change the name to match the name you used in step 2.

4. In the middle of the script, change the line that begins **make new alias file** to:

make new alias file at startup disk to x

5. Near the end of the script, change the line that begins **display dialog "The Alias(es) have been added** to read:

display dialog "The Alias(es) have been added to the startup disk." buttons {"OK"} default button 1

6. Edit the description of the script at the top of the script window, and then save and close the script.

If you prefer to have the alias created on the desktop (which is considered part of the startup disk), simply replace **startup disk** with **desktop** in steps 2 through 5.

In the book *Danny Goodman's AppleScript Handbook*, second edition (Random House Electronic Publishing, 1994), the author includes Alias Maker, a simple script that creates aliases in whichever folder you put the script—regardless of the folder's name or location.

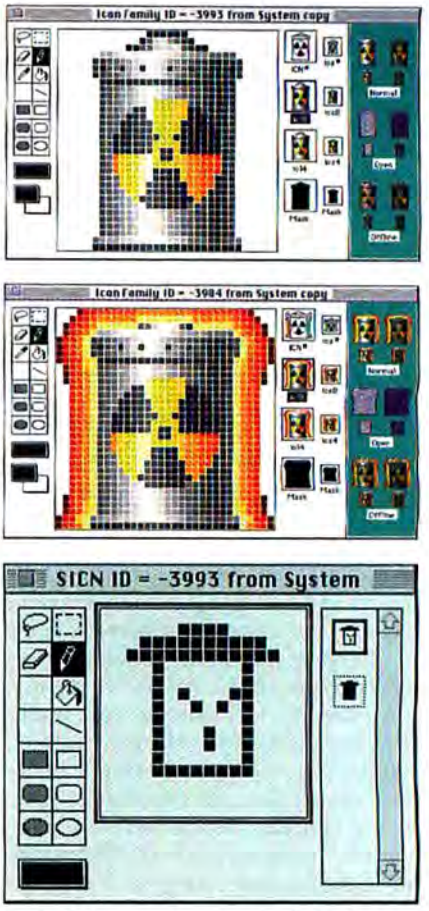
Trash Replacement

Q Is there any way to change the icon or name of the Trash?

Bob "boB" Morrix
Lutz, Florida

A Yes, but it does involve some work. Believe it or not, there are 15 variations of the Trash icon in the System file and Finder resources (combinations of empty and full; large, small, and tiny; and many colors, few colors, and no colors), though you needn't change all of them unless you want complete consistency. The same goes for renaming the Trash: you don't have to change all 25 menu items and messages in which it is mentioned, but you may want to. You can use ResEdit, Apple's resource-editing program, either to rename and design your own Trash icons or to paste replacement icons and text you obtain from an online service or a user-group library. Few of the canned replacements include all of the icon and text resources. "Trash Makeover" details the resources you'll need to modify.

Any time you modify the System file and Finder, there's a chance your computer won't be able to start up from the usual start-up disk. As a precaution, make sure you have another start-up disk—floppy, CD, or hard drive—that you have actually used to start up your computer. As a further precaution, work on copies of the System file and Finder you've made using the Finder's Duplicate command. After opening the System and Finder copies in ResEdit, editing their resources, and saving your edits, drag the unchanged System and Finder to the desktop, the start-up disk icon, or a folder on the start-up disk in case you want to restore them later. Then rename the edited System copy as System and the edited Finder copy as Finder. Close the System Folder and make sure its icon has the special look that identifies it as the active System Folder. (If it doesn't, try opening the folder, selecting the System and Finder, and closing the folder.) Restart to see the results of your Trash surgery.



Trash Makeover You can give the Trash a new look with ResEdit. In the System file, edit the ICN#, icl4, icl8, ics#, ics4, and ics8 resources -3993 (top) and -3984 (middle), and the SICN resource -3993 (bottom). If you change the icons' shapes, you must also edit their masks. If you want to change the icon that appears in the upper-left corner of the Trash window, edit the Finder's SICN resource 1130. To change the name of the Trash, you need to edit the text in the System file's STR# resource -6046, items 2 and 12. For complete consistency, you also need to edit the Finder's STR# resource 5000, item 31; STR# resource 8750, item 24; STR# resource 10250, item 3; STR# resource 11500, items 17 and 19; and STR# resource 11750, all items.

Preferred ClarisWorks Stationery

TIP When you create a new document based on stationery, ClarisWorks 3.0 normally lists a bunch of its assistants by default, but I prefer to have my own stationery show up first. ClarisWorks tech support said this couldn't be done, but I stumbled onto a workaround.

Noting that the Category pop-up menu in ClarisWorks' New Document dialog box is alphabetical—General, Home, None, and Small Business—and that ClarisWorks always lists the items from the first of those categories by default, I assigned my own stationery to a new category named Acme. Sure enough, my Acme category went to the head of the Category pop-up menu, but ClarisWorks still showed the General category by default. To see my Acme category, I had to choose it from the pop-up menu.

To get my category to appear first, I opened the ClarisWorks Assistants folder (inside the Claris folder in the System Folder) and removed all the assistants that appeared in the General category. With that category empty, it just disappeared from the Category pop-up menu. My Acme category, being alphabetically first, now appears by default when I create a new document based on stationery. I suspect that the same result would follow if you edited the General assistants and assigned them to a different category.

Philip H. Mayer
Oak Brook, Illinois

If you want to get rid of the General category but keep using the built-in assistants that are ordinarily in it, you have to change their categories. The only way I've found to do it is with ResEdit, as shown in "Changing an Assistant's Category."—L.P.

Tricks with Label Backing Paper

TIP For an instant transparent label, laser-print the label image on the slick side of a piece of label backing paper. Any number of applications can create the label. For example, if you have System 7.5 you can type your label in a Stickies window, use the Page Setup command to set the paper type to Monarch Envelope, and print on a 4-by-6-inch piece of backing paper. Stick clear tape over the printed image, transfer the image to the tape by burnishing firmly, remove the tape, and apply the resulting transparent label anywhere. For example, clear tape labels make great ownership ID tags, especially if you cut a few light slits into the edges of the tape to hinder removal.

You can extend this idea to make a quick disk label from a Finder window. Set the window to a list view (such as by Name), and use the Views control panel to reduce the number of columns shown in list views. (A label has room for the name, size, and date columns, as long as you don't expand any folders in the window.) Set the paper type to Monarch Envelope and the reduction factor to 55 percent. Print the window on a disk label that you have removed from its own backing paper and stuck onto a larger piece of backing paper. If your laser printer feeds envelopes from the edge, place the disk label at the top and about ⅜ inch from the left edge of the backing paper. If your printer feeds envelopes from the center, place the disk label at the top and about ⅜ inch to the right of center.

Another variation: A mirror image printed on backing paper can be ironed onto many surfaces, such as book endpapers and fabrics.

Dick Pruitt
Fort Worth, Texas

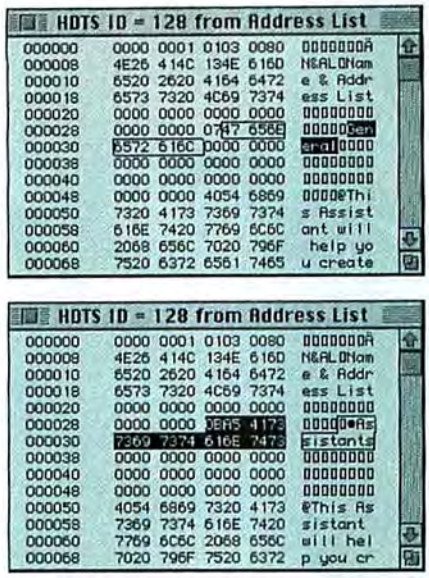
No More Moiré

TIP As one who frequently scans printed matter (to which we or our clients own the copyright), I used to wrestle endlessly with moiré patterns. Not even my scanner's descreen function could always get rid of my headaches. Now I scan at 718 dpi (with descreening on), reduce the scan's resolution to an appropriate setting, and sharpen. This technique works like magic on originals screened at 133 lpi or higher.

For scanners without a descreen function, try the following method. After scanning at 718 dpi, apply Adobe Photoshop's Median filter with a 2-pixel radius. Then reduce the resolution to something manageable and apply Unsharp Mask—settings of 50 percent, 3 pixels, and a threshold of 5 or above work well for me.

Eric Jones
Staten Island, New York

Other resolutions work as well, according to *Macworld*'s editorial production manager, Jeff Sacilotto. The trick is to scan oversize and not at an even multiple of the final resolution.—L.P. ■



Changing an Assistant's Category You cannot change the category of a ClarisWorks 3.0 assistant—such as Address List—with the Document Summary command. Instead, open the assistant file in ResEdit, and then open the file's HDTS resource 128. Find the word *General* in the rightmost column of the resource-editing window and select it (top).

Replace the selection by typing a different category name. If you change the length of the category name, you must enter the new length as a hexadecimal number in place of the 07 in the fourth column of the line that begins 000028. For example, changing the category name to •Assistants (which would come last alphabetically) would require changing the name length to 0B, which is the hexadecimal equivalent of 11 (bottom).

We pay from $25 to $100 for tips published here. Send questions or tips on how to use Mac computers, peripherals, or software (by mail or electronically) to *Quick Tips*, Lon Poole, at the address listed in *How to Contact Macworld* at the front of the magazine (include your address and phone number). All published submissions become the property of *Macworld*. Due to the high volume of mail received, we're unable to provide personal responses.

LON POOLE answers readers' questions and selects reader-submitted tips for this monthly column. His latest book is *Macworld System 7.5 Bible*, third edition (IDG Books Worldwide, 1994).

YOU WANT SPEED?

Consider The Options

You've got a Quadra or a Centris, and it's just not fast enough any more. You know that everywhere you look people are talking about the PowerPC. But you also know that buying a new computer and upgrading your software can cost a lot of money.

Now You Have A Choice

The DiiMOCache '040/50 Accelerator. It will make your Macintosh as fast as a PowerPC, even in native mode. And you won't have to buy new software. The best part is that with a retail price of only $899, the DiiMOCache '040/50 Accelerator will cost you hundreds, possibly even thousands of dollars less. The choice is clear. Get the DiiMOCache '040/50 Accelerator for your Macintosh today!

Compare The Results

The DiiMOCache '040/50 is a 68040 accelerator boosted to 50MHz with 128K Static RAM Cache. Its Slot-Free design keeps your PDS and NuBus slots free for other cards. Several models support the Quadra 610, 630, 650, 660AV, 700, 800, 900, 950 and Centris 610 and 650. Soon shipping for more 68040 Macs! Call now to get a full report on our benchmark tests done with today's graphics and desktop publishing software.

DiiMO

DiiMO Technologies, Inc.

800/503-4466

All DiiMO products can be purchased through authorized DiiMO resellers. The DiiMOCache '040/50 Accelerator carries a 30-day money back guarantee, a 3-year warranty and excellent toll-free tech support.

©1995 DiiMO Technologies, Inc. DiiMO® and DiiMOCache® are registered trademarks, and Slot-Free™ and the DiiMO logo are trademarks belonging to DiiMO Technologies, Inc. All other trademarks and trade names mentioned herein belong to their respective owners.

Circle 299 on reader service card

YOU'VE
BEEN
LOOKING
FOR IT.

THE
LATEST.

THE
BEST.

THE
CONNECTION.

THE
NETWORK.

THE
KNOWLEDGE.

THE
FUTURE.

THE
POWER.

IT'S ALL HERE.

MACWORLD EXPO BOSTON 1995

Building ON THE power

August 8-11, 1995

World Trade Center

Bayside Expo Center

REGISTER NOW AND SAVE!

Reaching New Heights

You've been looking for the ultimate technology thrill. Products so advanced they'll take your breath away. Experts so knowledgeable they'll easily solve your toughest questions. A glimpse at the future that's more reality than virtual. MACWORLD Expo/Boston is all that and more.

You'll feel the energy the instant you step through the door. Explore the possibilities the minute you view the products and services. Begin building your future as you mix and match from the best Macintosh and complimentary technologies. And be a few steps ahead of the pack as you head back to the everyday world.

Prepare to be dazzled as the East Coast comes alive at the largest and most comprehensive Macintosh-focused event! It's all here . . . networking, spreadsheet analysis, databases, education, research, word processing, accounting, law, CAD/CAM, forecasting, design, publishing, illustration, animation, music, programming, entertainment and multimedia.

Pre-Register Early and Save!

By registering early, you'll not only ensure your spot at this can't-miss event, you'll also save on conference and exhibit fees. Return the attached pre-registration form with your payment by June 30th and save $30 on all conference sessions and exhibits ($120 now vs. $150 at the door). An Exhibits-only admission saves you $15 ($25 now vs. $40 cash only at the door). All early registrants also receive their admission badge in advance. So rather than spending your time in line, you'll be spending your time with the Macintosh experts!

SPECIAL features

UGWUMP

(User Group Welcoming/Unwinding/Meeting Place) "People Networking Parlor" for user groups. Share success stories, exchange newsletters and literature. Learn how to start a user group in your area, and more!

Sponsored by User Group Connection

MacSciTech Resource Center

Where engineers and scientists can meet to discuss the Macintosh in chemistry, biology, computer science, design/test engineering, physics, mathematics, and more!

Sponsored by MacSciTech

Developer Central

If you're developing applications or custom solutions, you'll find the latest tools and training solutions for Macintosh and Newton development, including seminars taught by the world's best Mac techies!

Sponsored by Apple Computer, Inc. and MacTech Magazine

The MACWORLD Conference Program

Whether you're using your Mac to create or control, to teach or to learn, to communicate or coordinate, to save time or save money or make money — or *all* of these — the MACWORLD Expo Conference Program puts you in touch with the Macintosh industry's latest and greatest.

Learn what's new and exciting at Apple. . . chart your own course through cyberspace. . . cash in on the latest innovations. . . share insider's tips from the savviest Macintosh users in the universe.

M

The Conference PROGRAM

Here's a preview of the 12 separate conference tracks and individual sessions:

Your future at your fingertips

A. The Design/Art/Prepress Conference.

Celebrated artists, illustrators, designers, creators share intensely useful tips.

Kai's Killer Tips & Tools • Digital Photography • Creative Layouts • Prepress Forum: Tested Tips, Solid Shortcuts • Broadcast-Quality Graphics • Creative Imaging • Digital Fine Art Prints • Illustrator WOW! • Photoshop WOW! • Color Prepress 2000 • Plug-In to the Plug-In Developers!

B. The Connectivity Conference.

How users are enhancing communications and maximizing network efficiency.

Connect-Anywhere Networking • Essential Network Management Tools • AppleTalk Networking: Ask the Experts! • PowerTalk/PowerShare • TCP/IP • Coping with Multi-Platform Environments

C. The Online/Internet Conference.

Exploring the expanded dimensions, and boldly blazing new frontiers in cyberspace.

Getting Started with Telecommunications • A Beginner's Guide to the Internet • Intermediate Internet • Building a Web Site • All About Bulletin Board Systems (BBSs) • Publishing on the Internet • Superstars of Cyberspace!

D. The Multimedia Conference.

Maximizing your message with exceptional-quality presentations and productions.

Intro to Professional Desktop Video • Eye Popping Special Effects! • Masterful Insights on Interactivity • Animation Wizardry • Making Money with Multimedia • Authoring Tips and Techniques

E. The CD-ROM Conference.

Endless opportunities for disseminating information, combining impact with pizzazz.

The Beginner's Guide to Publishing a CD-ROM • Marketing Your CD-ROM • Interface Design for CD-ROM Titles • Developing Interactive Games • A Quick Overview of CD-ROM Authoring Tools

F. The Education Conference.

Teachers report on how they've turned their Macs into extraordinary learning tools.

Getting Started with the Mac in the Classroom • Integrating Macs into the Curriculum • Multimedia in Education • QuickTime for Educators • The Internet for Educators • HyperCard in the Classroom

G. The Small Office/Home Office (SOHO) Conference.

Successful small business owners share power tips for staying on top of your business.

How to REALLY Start Your Own Business • How Macs Can Help Run Your Small Business • The Frugal Entrepreneur Markets with the Mac

H. The Getting-Started Conference.

Complete guidelines for those who need a concentrated lesson to get up and running.

Design Principles for Non-Designers • How to Get Started with QuickTime • CD-ROM for Users: A Beginner's Guide • Multimedia Demystified

I. The Advanced User Conference.

Veteran users share their expertise and insider's tricks for maximum Macintosh power.

Resolving System Conflicts • Customizing Your Mac • A Power User's Guide to the PowerBook • Advanced Tips and Tricks for PageMaker 5

J. Special Interest Groups.

Compare notes with others in a similar setting, to get advice and solve special problems.

The Mac in Healthcare • The Mac in IS • The Mac in the Law Office • The Mac in Sci/Tech • The MACWORLD Expo User Group Extravaganza (MUSE)

K. Application Workshops.

Intensive training sessions by the award-winning MacAcademy staff.

Beginning Mac • Intermediate Mac • Advanced Mac • FileMaker Pro • Excel • PageMaker • Quark Xpress • Illustrator • Photoshop • HyperCard • Director

L. The You-Asked-For-It Conference.

Responding to your special requests, with up-to-the-minute market developments.

Macworld Magazine Presents: Where the Mac is Going • The *MacWEEK* 1995 Macintosh Product Forecast • Power Mac Update • The Complete Newton Guide • Scripting Applications with AppleScript

*Conference tracks subject to change.

1995 MACWORLD EXPOSITION

WORLD BOSTON EXPO

Registration Form

Pre-register by June 30 and Save $15 to $30!

1. Registration Selection and Fees

❑ **Package One $120**
Conference Sessions and exhibits. Pre-register by June 30 ($150 at the door).

❑ **Package Two $25**
Admission to exhibits only. Pre-register by June 30 ($40 cash only at the door)

❑ **Check if Applicable**
I'm an international attendee. Please ship my badge by Federal Express. Enclosed is an additional $45.

Please choose your package and fill out the form completely. Incomplete forms will be returned. One form per person; make photocopies for additional people. Registration forms received after June 30 will be returned unprocessed. Purchase orders cannot be accepted. All registration fees are non-refundable. A $20 fee will be charged for all returned checks. Send completed forms to: **MACWORLD Expo/Boston**
P.O. Box 4010
Dedham, MA 02027

U.S. Badges: will be mailed around July 24
International Badges: (including Canadian) will be held on-site at the International Pre-registration counter at Bayside Expo Center.
Badge Pickup Hours: August 7, 11:00 a.m. - 3:00 p.m.; August 8-10, 9:00 a.m. - 6:00 p.m.; August 11, 9:00 a.m. - 4:00 p.m.

2. Payment Method

❑ Check enclosed (make payable to MACWORLD Expo) ❑ Master Card ❑ Visa ❑ American Express Amount $ _____

Account Number _____ Exp. Date (include all numbers) ____/____

Card Holder Signature (Signature necessary to be valid) _____

If card holder is other than registrant, please print card holder's name below:

First Name _____ M.I. ____ Last Name _____

3. Customer Information

Please check one: ❑ Home Address ❑ Company Address

First Name _____ M.I. ____ Last Name _____

Street Address _____

City _____ State _____ Zip Code _____

Country (Other than U.S.) _____ Telephone _____

Fax _____

If mailing to company address: (If mailing to your home address, leave the next two lines blank).

Title _____

Company _____

4. Attendee Profile

WHAT IS YOUR INDUSTRY OR PROFESSION? (Check one)
- ☐ 1. Accounting/Finance
- ☐ 2. Architecture/Construction
- ☐ 3. Art/Design/Creative Services
- ☐ 4. Arts & Entertainment
- ☐ 5. Communications/Printing/Publishing
- ☐ 6. Computer Reseller/VAR/VAD
- ☐ 7. Consulting
- ☐ 8. Corporate/General Management
- ☐ 9. Distributor/Dealer/Retailer/Service
- ☐ 10. Engineering/R&D
- ☐ 11. Government/Military
- ☐ 12. Health/Medical Services
- ☐ 13. College/University
- ☐ 14. Elementary/High School
- ☐ 15. Legal Services
- ☐ 16. Manufacturing (Computer Industry)
- ☐ 17. Manufacturing (Non-computer Industry)
- ☐ 18. Marketing/Sales/PR/Communications
- ☐ 19. Other _____
- ☐ 20. Does Not Apply

WHAT IS YOUR JOB TITLE OR FUNCTION? (Check one)
- ☐ 21. Corporate Executive (Pres./VP/CFO/Owner)
- ☐ 22. Controller/Treasurer/Accountant
- ☐ 23. DP/MIS Manager
- ☐ 24. Network Manager
- ☐ 25. Programmer/Analyst
- ☐ 26. Engineer/Scientist/R&D
- ☐ 27. Manager/Department Head
- ☐ 28. Professional (Lawyer, Doctor, etc.)
- ☐ 29. Consultant
- ☐ 30. Marketing/Sales
- ☐ 31. Educator
- ☐ 32. Art Director/Graphics
- ☐ 33. Editor/Writer
- ☐ 34. Student
- ☐ 35. Other _____
- ☐ 36. Does Not Apply

WHAT IS THE SIZE OF YOUR ORGANIZATION? (Check one)
- ☐ 37. Under 50
- ☐ 38. 50 - 99
- ☐ 39. 100 - 499
- ☐ 40. 500 - 999
- ☐ 41. 1000 & over
- ☐ 42. Does Not Apply

WHICH PERSONAL COMPUTER(S) DO YOU OWN/USE? (Check all that apply)
- ☐ 43. Macintosh Plus/SE/SE30
- ☐ 44. Macintosh Classic Series/LC Series
- ☐ 45. Macintosh Powerbook Series/Duo Series
- ☐ 46. Macintosh II Series
- ☐ 47. Macintosh Performa Series
- ☐ 48. Macintosh Centris Series
- ☐ 49. Macintosh Quadra Series
- ☐ 50. Macintosh Workgroup Series
- ☐ 51. PowerMac
- ☐ 52. IBM PC or compatible
- ☐ 53. Other _____
- ☐ 54. None

DO YOU RECOMMEND, BUY, OR APPROVE MICROCOMPUTER SOFTWARE AND/OR PERIPHERALS?
- ☐ 55. Yes
- ☐ 56. No

IF YES, PLEASE INDICATE FOR HOW MANY MACINTOSH COMPUTERS YOU HAVE THIS INVOLVEMENT.
- ☐ 57. 1-10
- ☐ 58. 11-25
- ☐ 59. 26-50
- ☐ 60. 51-100
- ☐ 61. 101-500
- ☐ 62. 501+

JUL

♻ Recycled Paper

Attending made easy

U.S. Attendees: Badges will be mailed on or about July 24. Be sure to check box indicating where badge should be sent.

International Attendees: International Badges (including Canadian) will be held for pick-up at the International Pre-registration counter at Bayside Expo Center. Badge pick-up hours are: August 7, 11:00 a.m. - 3:00 p.m.; August 8-10, 9:00 a.m. - 6:00 p.m.; August 11, 9:00 a.m. - 4:00 p.m. For Federal Express service, check the appropriate box on the pre-registration form and add $45 to your pre-registration fee. Fill in your exact street address (no P.O. boxes) and include your telephone number and country code. We will Federal Express your badge directly to you.

Hotel	Single/Double	Telephone
57 Park Plaza 200 Stuart St.,Boston, MA 02116	$120/130	617-482-1800
Back Bay Hilton 40 Dalton St., Boston, MA 02115	$155/175	617-236-1100
Boston Marriott Copley 110 Huntington Ave., Boston, MA 02116	$179/179	617-236-5800
Boston Marriott Long Wharf 296 State St., Boston, MA 02109	$239/259	617-227-0800
Boston Park Plaza 64 Arlington St., Boston, MA 02116	$138/159	617-426-2000
Colonnade Hotel 120 Huntington Ave., Boston, MA 02116	$180/200	617-424-7000
Copley Plaza 138 St. James Ave., Boston, MA 02116	$188/208	617-267-5300
Four Seasons Hotel 200 Boylston St., Boston, MA 02116	$266/290	617-338-4400
Guest Quarters Hotel 400 Soldiers Field Road, Boston, MA 02134	$163/173	617-783-0090
Harborside Hyatt 101 Harborside Drive, Boston, MA 02128	$175/195	617-568-1234
Hilton at Dedham Place 95 Dedham Place, Dedham, MA 02026	$135/135	617-329-7900
Holiday Inn Government Center 5 Blossom St., Boston, MA 02114	$153/169	617-742-7630
Hyatt Regency Cambridge 575 Memorial Drive, Cambridge, MA 02139	$165/185	617-492-1234
Le Meridien Hotel 250 Franklin St., Boston, MA 02110	$215/215	617-451-1900
Lenox Hotel 710 Boylston St., Boston, MA 02116	$150/170	617-536-5300
Logan Airport Hilton Logan International Airport, E. Boston, MA 02128	$140/160	617-569-9300
Omni Parker House 60 School St., Boston, MA 02108	$150/170	617-227-8600
Ritz-Carlton Hotel 15 Arlington St., Boston, MA 02117	$225/250	617-536-5700
Royal Sonesta 5 Cambridge Parkway, Cambridge, MA 02142	$150/150	617-491-3600
Sheraton Boston Hotel & Towers 39 Dalton St., Boston, MA 02199	$160/175	617-236-2000
Sheraton Tara Braintree 37 Forbes Road, Braintree, MA 02184	$125/125	617-848-0600
Swissôtel One Ave. de Lafayette, Boston, MA 02111	$165/175	617-451-2600
Tremont House 275 Tremont St., Boston, MA 02116	$119/129	617-426-1400
Westin Copley 10 Huntington Ave., Boston, MA 02116	$189/209	617-262-9600

Fly American Airlines and Save

Enjoy savings on applicable fares when you fly American Airlines, the official airline of MACWORLD Expo. American is offering attendees discounts of 5-10% on most fares. Dial 800-433-1790 to speak with an American Airlines reservationist and reference Star File #S1085AL. Savings are on applicable fares only.

Car Rental Discounts from Alamo

Alamo Rent a Car is pleased to offer discounted rates to MACWORLD Expo attendees. To receive preferred rental rates, please contact Alamo directly at 800-732-3232 and reference Group ID #378360, Rate Code "GR" and "1G". Advance reservations are required.

Hotel Accommodations

MACWORLD Expo has grown over the years and the demand for hotel rooms has grown too. With this in mind, we want to ensure your room is waiting for you. Attendees must make a *non-refundable deposit* for the first and last night at the time you make your reservation. If you are reserving 10 or more rooms, you must supply the hotel with a rooming list by June 26. Participating hotels in the Boston area are offering MACWORLD Expo discounts. To receive the preferred rate, call one of the hotels listed and mention you'll be attending MACWORLD Expo. There are only a limited number of rooms at the preferred rate and they sell-out quickly. Make your reservations by July 10 for the best selections (rates and availability cannot be guaranteed).

Services for the Physically Challenged

We're committed to ensuring that our physically challenged attendees receive all the services they need to make their visit enjoyable. We offer services such as wheelchairs and interpreters for the hearing impaired. Call us at 800-945-3313 for details.

Getting There, Once You're Here

Taking public transportation once you're in the city is highly recommended. Take the Red Line to the JFK/UMass stop, Bayside Expo will be within walking distance, or take the Red Line to South Station where you can take the free shuttle to the World Trade Center. The Complimentary MACWORLD Expo shuttle will connect you with both Expo locations.

For more information call the MACWORLD Expo Information Hotline at 800-645-EXPO, 24 hours a day, seven days a week.

MACWORLD EXPOSITION

WORLD TRADE CENTER • BAYSIDE EXPO CENTER

EXHIBITS HOURS: AUG. 8-10: 10:00 A.M. – 6:00 P.M.
AUG. 11: 10:00 A.M. – 4:00 P.M.

CONFERENCE HOURS: AUG. 8: 9:30 A.M. – 5:15 P.M.
AUG. 9-10: 11:30 A.M. – 5:15 P.M.
AUG. 11: 11:30 A.M. – 2:15 P.M.

EDITED BY ELIZABETH DOUGHERTY

Networks

THE LATEST IN CONNECTIVITY AND COMMUNICATIONS

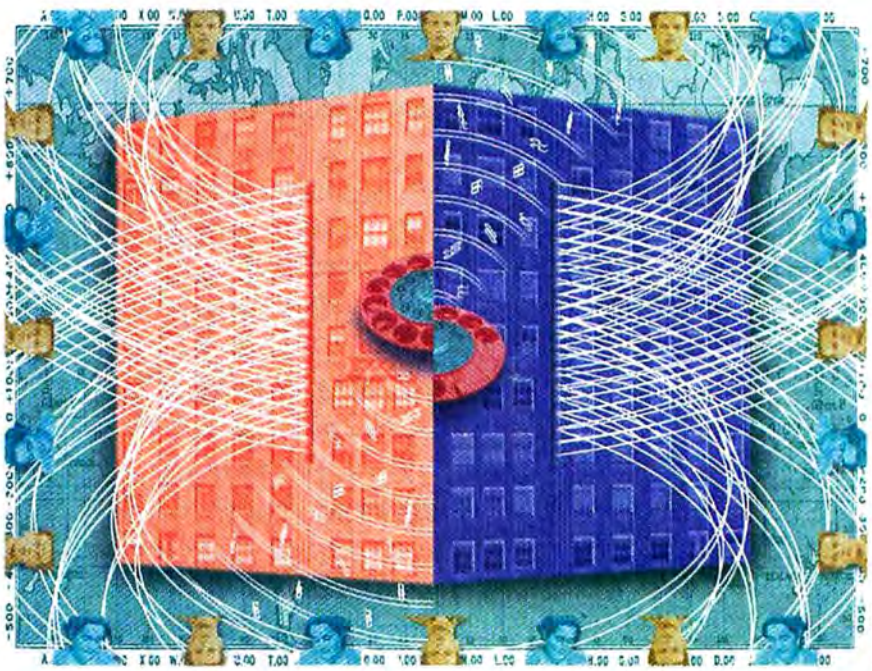
Making Macs into Internet Servers

PUBLIC DOMAIN AND SHAREWARE Internet information-server software has been available for some time; the announcement of several commercial offerings and a bundled server from Apple indicate that the Mac is coming of age for businesses that want to create a presence on the Internet.

Delphic has the most ambitious design; its software, ALI Internet Server ($995 to $1995 list), will combine more than eight Internet server functions—including some never before available on the Mac. When it is released in the third quarter of 1995, ALI will include domain name system (DNS), simple mail transport protocol (SMTP), network news transfer protocol (NNTP), post office protocol (POP3), Gopher, World Wide Web HyperText Transfer Protocol (WWW HTTP), and Finger server software, plus mailing-list manager software—all the tools needed to build a complete, self-contained corporate Internet server and gateway, in one package.

InterCon Systems' InterServer ($795 list), due to ship in June, will offer WWW HTTP, Gopher, and FTP services. InterServer lets Web clients access HyperText Markup Language (HTML) files, applications, and AppleScript functions running on the Mac server.

StarNine Technologies is building on its E-mail expertise by offering WebStar (formerly MacHTTP, a noncommercial HTTP server developed by BIAP Systems). Scheduled to ship in May, WebStar will cost $269 until July 20, when it will cost $795. It will include FTP and Gopher. In June, StarNine expects to ship two add-on WebStar products—the Commerce Toolkit, for electronic commerce support, and Security Toolkit, for client-server communications—and ListStar ($295 for LAN E-Mail, $795 for SMTP), an E-mail list-management and information-dissemination tool formerly called EMail-On-Demand.



STUART BRADFORD

Maxum Development already offers two WebStar add-on applications: NetCloak and NetForms (each costs $500 per server). NetCloak lets you control how your Web page looks to different users based on criteria such as browser type, password, and time of day. NetForms takes information that users enter in browser forms, formats it in HTML, and publishes it on the server, adding extras like hypertext and navigational links.

Apple is bundling the software for setting up a Web site—including WebStar; a one-user license for Netscape Communications' Netscape; AppleSearch; BBEdit, an HTML editor from BareBones Software; and Adobe Acrobat Pro—with configurations of the Apple Workgroup Server. The bundled product, called the Apple Internet Server Solution for the World Wide Web, is scheduled to ship in May; the company's estimated prices range from $2909 to $8209.

Apple, 408/996-1010; Delphic, 909/792-7932; InterCon, 703/709-5500; Maxum, 708/608-9440; StarNine, 510/649-4949.—JOEL M. SNYDER

Internet Links for the LAN

WHILE AN ONLINE SERVICE MIGHT be enough for an individual connecting to the Internet, to provide a business presence on the Internet really requires a direct connection.

Unlike a shared modem pool, which requires a separate telephone line for each concurrent user, a direct Internet con-

nection lets many users share a single telephone line simultaneously. A direct connection carries TCP/IP packets in an intermingled stream; a remote Internet service provider sorts out the traffic and routes it to the correct destination. Individual users can run multiple Internet client applications, allowing interactive access while batch processes, such as E-mail transfer, work in the background.

Most significant, though, a direct connection permits two-way Internet communications between any network user and another Internet user, enabling actions such as direct file transfer and videoconferencing. A direct connection also lets companies become Internet information providers via FTP, Gopher, and World Wide Web servers.

Direct Internet connections require a well-defined security policy, which could be as simple as disallowing all inbound Internet connections. A firewall—an intermediate host system between your network and the Internet—typically costs from $5000 for home-grown versions to $20,000 for turnkey packages that monitor and limit Internet traffic.

A direct network Internet connection has three components: a multiuser TCP/IP Internet account (called LAN IP service), a WAN-access device, and a TCP/IP router.

LAN IP service Internet service providers typically sell LAN IP service for a fixed monthly fee with unlimited access. The service provider charges a one-time setup fee of about $250 to $500. Monthly costs vary with the connection speed, from $150 per month for 28.8-Kbps modem access to $500 per month or more for higher-speed digital connections. For instance, PSI's nationwide 19.2-Kbps LAN-Dial service costs $300 for start-up and $150 per month; 64-Kbps digital service costs $250 per month.

WAN-access device The WAN-access device connects your network to the telephone line. The least-expensive (and lowest-bandwidth) WAN-access device is an analog modem, which costs between $100 and $300 and supports speeds of 14.4 Kbps to 28.8 Kbps. Modem compression can improve overall throughput by about 50 percent.

A 56-Kbps Data Service Unit (DSU) requires a switched 56 digital data service line, which is pricey at $100 to $300 per month. Motorola's DA56 is a popular DSU selling for under $300.

Fast displacing switched 56 access, Integrated Services Digital Network (ISDN) is offered in most major metropolitan areas. ISDN provides two 64-Kbps data channels, usually at less than $100 per month. ISDN WAN devices, or terminal adapters, range from $599 list (under $500, street) for 3Com Access Products' 3Com Impact digital modem to $1695 for an Ascend Pipeline-50 router. Terminal adapters can bond the two data channels into a single 128-Kbps channel. Beyond 128 Kbps, frame-relay supports data rates up to T1 (1.544 Mbps).

TCP/IP router A TCP/IP router acts as an interface between your network and the WAN-access device. Ascend's Pipeline-50 series ($995 to $1695) combines a router with an ISDN or a frame-relay interface. Global Village's One World Internet Service bundles a router with a 28.8-Kbps modem for $1999.

3Com Access Products, 908/721-1337; Apple, 408/996-1010; Ascend Communications, 510/814-2303; Global Village, 408/523-1000; Motorola, 205/726-0789; PSI, 703/709-0300.—MEL BECKMAN

IN BRIEF

■ **ISDN Modems** ZyXel plans to ship in May combined V.34/ISDN modems equipped with a 4MB EPROM for protocol upgrades. List prices for the 2864I-series modems, which perform at up to 512 Kbps, range from $549 to $749. 714/693-0808.

■ **Ethernet Hardware** Linx Networks offers a mail-order line of competitively priced network equipment. 415/934-2600.

AppleShare and Servers Speed Up

APPLE HAS ROLLED OUT upgraded Apple Workgroup Server (AWS) models based on faster PowerPC 601 chips. The CPU in the new AWS 9150 runs at 120MHz, faster than any other Mac, and the 9150 accommodates up to five drives. The CPU in the revised AWS 8150 runs at 110MHz and in the 6150 at 66MHz. Company-estimated prices range from $2549 to $8709, depending on configuration. Each model comes in various configurations, or Apple will build to order.

On the faster servers, Apple claims that the AppleShare 4.1 upgrade runs almost twice as fast as AppleShare 4.02. On existing AWS models with slower PowerPC CPUs, Apple expects a 75 percent speedup. Apple attributes the gains to an improved desktop database cache, a larger read-ahead and write-behind cache, and a read-ahead and write-behind cache added to the client software. To take advantage of improvements, upgraded clients must be running System 7.5. The upgrade costs $199.

Software bundled with the servers includes Wave Research's FileWave software-distribution software (see *Reviews*, in this issue). Apple, 408/996-1010.
—NANCY E. DUNN

Slew of Remote-Access Options

REMOTE-ACCESS CHOICES CONTINUE to mount, with introductions and upgrades from Dayna Communications, Shiva, 3Com, and Microcom.

Dayna is adding TCP/IP, IPX, and PPP support to its DaynaLink 2.0 Mobile Access Server, due to ship in June. The server ($3295), based on easy-to-upgrade data/fax-modem PC Card (formerly called PCMCIA) devices, used to support only Apple Remote Access. Upgrades for DaynaLink for ARA will cost $595.

ERIC HARGER

PC Card (PCMCIA) devices let you upgrade Dayna's remote-access server to support more protocols.

3Com's AccessBuilder 2000 supports protocols such as AppleTalk, TCP/IP, and IPX. Due to ship in May, the four-part version lists for $2795.

In July, Microcom plans to ship client software for its LANexpress remote-access servers (prices start at $3499) that will support PPP and ARAP 1.0 and 2.0.

Release 3.5 of Shiva's LanRover line includes a graphical tool for LAN-to-LAN setup and additional security functions, such as automated password expiration. Prices for LanRover, which supports ARA, TCP/IP, and IPX, start at $2799. Upgrade kits cost $199 to $699.

3Com, 408/764-5000; Dayna, 801/269-7200; Microcom, 617/551-1000; Shiva, 617/252-6300.—NANCY E. DUNN

A word about Viking Components:

Quality

At Viking Components we treat every memory product we manufacture like a 17th century Stradivarius. Each is intricately designed, meticulously assembled and thoroughly tested– just like the famous violin.

The only area we really fall short of the Stradivarius is price. (Viking memory modules cost quite a bit less.) In fact we're one of the best values you'll find in the memory business.

And like the Stradivarius, a Viking memory product is built to last a lifetime...and more. In fact every Viking product is backed by our exclusive *Lifetime Replacement & Service Warranty*, whereby we not only guarantee the part, but reimburse the dealer for service call if one should ever be necessary.

Modules, expansion boards, credit cards and more. Over 900 products to upgrade virtually any make and model of computer or laser printer. Call today and we can make beautiful music together.

VIKING COMPONENTS

Manufacturing Tomorrow's Products...Today!

For Dealer Nearest You Please Call: 1-800-338-2361

Circle 233 on reader service card

BY CARY LU

PowerBook Notes

On the Road

WHEN TRAVELING WITH A PowerBook—especially internationally—you can expect to encounter many different kinds of power plugs, power adapters, and phone plugs. Here's how to make the best use of whatever you find.

Power Plugs and Adapters

The standard North American power plug comes in three variants—two-prong unpolarized (Apple's 100-series PowerBook AC adapters); two-prong polarized, in which one prong is wider than the other; and three-prong grounded (Duos and 500-series AC adapters). In older buildings, the wall jacks are often two-prong unpolarized. To connect with a Duo or 500-series PowerBook, you need a three-prong–to–two-prong adapter, but the adapters sold today have polarized prongs and won't fit. Some people file down the wider prong to make connection possible; they argue that for a small, well-insulated, transformer-operated power supply, the modification poses no significant hazards as long as the modified adapter isn't used for anything else. But filing down prongs defeats a safety feature, so I cannot recommend it.

Apple's AC adapters for PowerBook computers work on all standard AC power around the world, from 100V to 240V AC, 50Hz to 60Hz. You don't need to use a transformer or a voltage converter, only a suitable power-plug adapter or a replacement power cable for a Duo or 500-series AC adapter. Power-plug adapters for a specific country are widely sold in hardware and electronics stores in that country.

If you want to buy before you travel, Magellan's (805/568-5400, 800/962-4943) sells seven different plug adapters ranging from $2.85 to $9.85; a kit of the most common five adapters costs $9.85, and all seven cost $23.55. TeleAdapt (408/370-5105) sells the same adapters for $10 each, $50 for all seven. The Magellan's catalog and a TeleAdapt flyer list the common plug types for 150 countries; in some countries you may run across local variations.

(A PowerBook will nevertheless work with a step-up or step-down transformer, as long as final voltage is within the 100V-to-240V limit. Do not use a PowerBook—or most electronic devices—with a lightweight voltage converter made for hair dryers and other heating devices.)

PHOTOGRAPH BY MARK JOHANN; SCREEN IMAGE BY GARRY GAY/IMAGE BANK

Car-Battery Adapters

Car batteries can supply power without plug problems because cars around the world use the same cigarette-lighter connector. The common car-battery adapters work on 11V-to-14V DC sources—sufficient for 12V car batteries, which can run up to 13.8V. If you work on private aircraft or large boats, or in ambulances or industrial and military vehicles whose batteries supply 24V or 28V, look for a car-battery adapter that can run off batteries as high as 30V.

Most car-battery adapters operate a single computer type; an adapter for a Duo will not work with a 500-series PowerBook, for example. The most interesting car-battery adapter is Empire Engineering's (805/543-2816) SmartAdapter system sold by Nesco Battery Systems (818/781-0505, 800/606-3726). Due in May, the SmartAdapter consists of a small $74.99 SmartSupply and a $24.99 SmartCord for your computer model. The SmartCord connects the SmartSupply to the computer and contains circuitry that sets the output voltage and current. To change computer types—the SmartAdapter can accommodate all PowerBook models and many PC compatibles—you simply change SmartCords. The SmartSupply runs off batteries producing 10V to 30V DC; SmartCords support output from 5V to 30V DC with maximum power of 25 watts, sufficient for all common laptop computers and most portable audio equipment.

The SmartAdapter system offers a way to get power on airliners. Empire is negotiating with several airlines to provide power at every first-class and business-class seat—either through a 28V power supply or with a SmartSupply built into the seat. In the first case, you'll need your own SmartSupply and SmartCord; in the second case, you'll need only a SmartCord.

I've written in the past about the 115V AC power outlet in the washrooms of most airliners. All such outlets I've tried in the past year have been disconnected—as a safety measure, according to the airlines.

Inverter Power

Car-battery adapters produce DC power specifically for the PowerBook. An inverter is bulkier, but since it converts a car battery's 12V DC to 115V AC, it can run any AC device within its rated power. For a PowerBook, the smallest suitable inverter I've seen is the 50w, 6.5-ounce Notepower sold by Statpower Technologies (604/420-1585) for about $40. For about $70, the 8-ounce PocketSocket from PowerStar (408/774-6800) supplies 100w, enough for two or three portable devices. The more-common 140w inverters are

continues

The power to do what they never imagined you could do.

The power to do what you never imagined you could do.

The power to make others see beyond the surface.

The power to make a lifelong dream come true.

The power to shine.

The power to be accepted for who you really are.

The power to not always have to ask for help.

It's the power of freedom.

It's the power of independence.

It's the power of Macintosh.

The power to be your best.

For more information on Apple® products, contact us at 800-600-7808, 800-755-0601 (TTY), or on the Internet at applewdsg@eworld.com.

Apple

© 1995 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, Macintosh and "The power to be your best" are registered trademarks of Apple Computer, Inc. All Apple products are designed to be accessible to individuals with disability.

much larger—the size of two thick trade paperbacks stacked together—and usually sell in the $50-to-$100 range. Inverters typically produce a square wave or a modified stepped square wave rather than the smooth sine wave that comes out of wall outlets, but PowerBook AC adapters work fine nevertheless.

Modem Connection

The modular RJ-11 telephone plug, ubiquitous in North America, is also found in most of the Western Hemisphere, in much of Asia, and in a few Middle Eastern countries. The rest of the world uses dozens of different phone-plug types. Major international hotels sometimes use RJ-11 plugs even if most local phones use another kind. In many countries, adapters that convert an RJ-11 plug–equipped modem to the local phone plug are sold in local hardware and electronics stores. TeleAdapt sells 36 different phone-plug adapters; a single adapter costs $29.99, $72 for four. TeleAdapt offers many sets of adapters for particular regions of the world; a complete set of 36 adapters sells for $449.99. Magellan's and Global Village offer the same adapters (Magellan's sells individual adapters for $22.50; a set of 36 costs $495).

Aside from the plug, phone systems may use different signals to indicate dial tone, busy signal, and ringing. Some modems can handle these differences easily through country configurations stored in the modem's ROM. Recent modems using the Rockwell chip set can be configured for 18 countries with the AT*NC*n* command (*n* is the country code) followed by ATZ.

A modem configured for use in the United States and Canada may refuse to dial in other countries if it does not detect a dial tone. If you cannot reconfigure, instruct the modem to ignore the dial tone ("blind dial") by issuing an ATX1 command in the modem-initialization string of your communications software. Almost all such software will let you make this change. TeleAdapt offers detailed flyers on how to do this with half a dozen popular programs. The inability to detect the busy signal is not a major problem, since you can usually hear the call's progress on the speaker. Detecting the ringing signal matters only if you set the modem to auto-answer for data or fax.

If the phone line does not respond to tone dialing, try pulse dialing. In some cases you may have to adjust the pulse duration. Check your modem's manual for the command—AT&P*n*, where *n* is 0, 1, or 2. Some countries use a periodic high-pitched beep signal to time calls for billing. The TeleFilter from TeleAdapt ($59.99) and Magellan's ($49.50) filters out the beeps.

Some countries have strict regulations about modems connected to the local phone system. As a practical matter, such regulations are difficult to enforce, particularly if you are simply a traveler passing through.

Using a cellular phone internationally may require a different phone in many countries; contact your cellular provider for information about international roaming. In Europe and Australia, the cellular phone system is switching over to the GSM (Groupe Speciale Mobile) digital format, which is incompatible with cellular hardware used in North America. Sending data over GSM requires a specialized PC Card (PCMCIA); standard modems won't work. For more on using modems with cellular phones, see *PowerBook Notes*, January 1995.

Many airliners now have in-flight phones with modem jacks, but the charges are high—typically $4 for the first minute and $2 for each additional minute—and the phones tend to be unreliable. Users report eight or ten attempts before making a successful connection.

X rays and Metal Detectors

Should you run your PowerBook and floppy disks through X-ray inspection at airports or insist on a hand inspection? In some airports, you have no option; everything must go through X-ray screening.

Most older PowerBook manuals say not to run the computer through X-ray inspection, but they're wrong. (Current Apple manuals make no clear recommendation.) X rays won't damage computers or magnetic media and neither will the motors for the conveyor belt that runs through the X-ray machine and metal detectors. There are only two dangers at a security checkpoint—having your computer dropped or stolen.

Lighting the Keyboard

If you often work in dark places—such as in a car's passenger seat or in an airplane with the overhead light off so those nearby can sleep—a keyboard light may come in handy. ASF Associates (516/868-3638, 800/771-3600) sells the NCL4 80, a small $39.95 light that clips on top of a laptop's screen. It comes with four rechargeable AA cells, an AC adapter/charger, and a carrying case; the total traveling weight is 14 ounces. For two hours on a charge, it lights the keyboard as well as papers next to the computer. **m**

CARY LU is a *Macworld* contributing editor who covers mobile- and remote-computing issues in this monthly column.

BY DAVID POGUE

Gotta CD Doctor?

Medical discs to make you a more knowledgeable patient

TODAY'S MEDICINE SURE ISN'T what it used to be. Hey listen, when I was a kid, eggs were good for you, alcohol wasn't, and the "national health-care debate" was whether or not girls had cooties.

Today, you've got HMOs, you've got CT scans, and even so much as *thinking* about a hospital carries a $900 deductible. Well, the Macintosh has solved all our other problems, so why can't it help us through the murk of modern medicine? Why doesn't somebody plug all the symptoms and diseases into a smart, snappy, self-help CD-ROM database? Why couldn't such a program explain a problem with video, animations, and a musical sound track? (How many real doctors do that?) In fact, why doesn't Congress issue every American a Power Mac 8100, let us research our own problems, and shave billions off our national health-care tab?

As far as I can tell, there's only one thing standing between that scenario and reality: the difficulty of getting great doctors and great multimedia programmers together. As you'll see, such a collaboration seems to be as hard to find as a cure for the common cold.

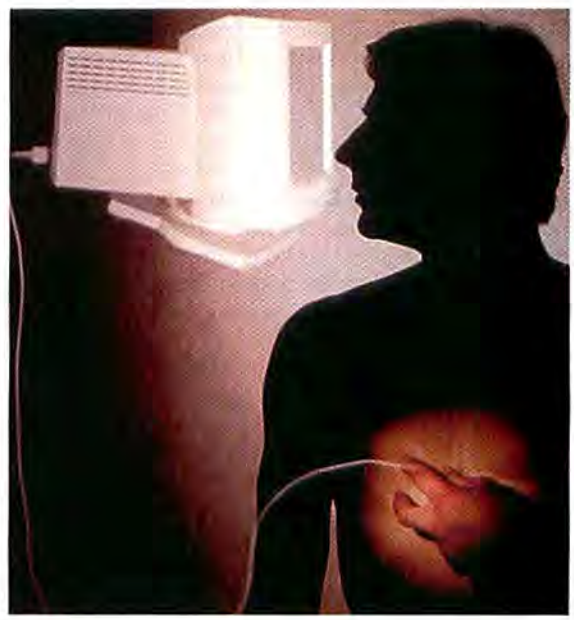
Mayo Clinic Family Health Book

Talk about electronic books! This CD-ROM ($59.95; IVI Publishing, 612/996-6000, 800/432-1332) is closely based on the hardbound volume of the same name. Both give you an accurate, authoritative, and complete text that captures a snapshot of modern medical thinking: infant care, exercise, diet, AIDS, the health-care system, death and dying, and so on. The writing is spectacular, the advice is careful and sound, and the information is up-to-date and interesting.

Actually, maybe the conversion from book to disc was *too* faithful. There's not much to do here besides reading. True enough, little icons appear in the text, indicating that one click will make a diagram appear. But they appear far too infrequently; in the entire CD, there are only 45 animations (all short and simple—only 3 are QuickTime movies). Perhaps the best evidence that the programmers have left the *multi* out of multimedia is that the compact disc itself is two-thirds empty. Fill 'er up!

The act of reading this magnificent prose isn't pure pleasure, either. All you get is 12-point Geneva; you can't resize the window (too bad for the anatomy feature); and the scroll bar doesn't change screens properly—when you page down, the last line you read becomes the *third* line of the new screen.

But to be fair, virtually every other detail of this disc was done right. The Search command works beautifully. Navigation is clean and simple. There's a refreshing freedom from the usual screaming "FOR ENTERTAINMENT PURPOSES ONLY" disclaimers. The prices of the book and CD-ROM are $20 apart; which one to buy otherwise boils down to choosing the surface you prefer reading from.



Mayo Clinic—The Total Heart

As you can imagine, this CD-ROM is nearly identical to the Family Health Book in design and format ($34.95; IVI Publishing). In this case, however, the real-world book that has been electronified is the *Mayo Clinic Heart Book*. Sure enough, the entire disc concerns that one particular muscle: its anatomy, its diseases, surgery, tests, emergency care, a drug directory, and so on. Once again, the text is impeccably edited and painstakingly user-friendly; once again, simple diagrams and short animations occasionally appear.

Actually, you may well learn more from this disc than from Family Health Book. That more general disc covers plenty of stuff everybody already knows—the evils of smoking, the benefits of a low-fat diet, and so on. The Total Heart, on the other hand, delves deeper into a more focused topic and yields some surprising information: on women and heart disease, on the history of cardiology, or a blow-by-blow description of what to expect when you go in for heart surgery.

A.D.A.M. The Inside Story

It's like something out of "Star Trek": as you drag the scroll bar downward, successive layers of the subject's body melt away. Skin, fat, muscle, organs, bones—layer by layer, until the bones themselves have been eaten half away.

Fortunately, the subjects are Adam and Eve, the cheerful, full-color hosts of this amazingly infotaining CD-ROM ($49.95; A.D.A.M. Software, 404/980-0888, 800/408-2326). You choose the view (front or back), the gender, and one of four popular skin colors; that amazing scroll bar does the rest. At any time during your virtual dissection session, you can click on a body part or organ to read its medical or colloquial name ("clavicle [collarbone]"). The viewing area can be as large as your monitor, although most people will wind up moving the currently displayed body-part rectangle up or down as needed.

continues

HEADS, IT'S REAL. TAILS, IT'S FAKE.

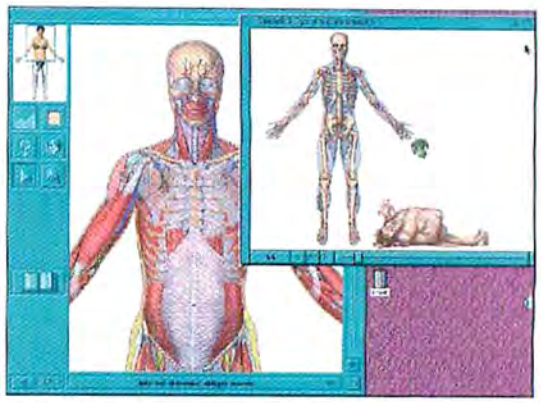
It's your choice. A little more than 50 percent of all business software in use today is pirated. If you buy it, you could end up with virus-ridden, phony software that has no documentation or product support.

Selling or copying pirated software without authorization is against the law, with severe criminal and civil penalties including imprisonment of up to five years, fines of up to $250,000, or both. If you suspect the sale or use of pirated software, call the BSA Anti-Piracy hotline:

(800) 688-BSA1 (2721)

BSA Business Software Alliance

© 1993 Business Software Alliance. All rights reserved.



Call Him Spineless In the larger A.D.A.M. window, you can see Eve in partial body-part undress. In the smaller window, a QuickTime movie demonstrates what happens to Adam when his skeleton is removed. (The movie gets less silly after the opening joke.)

If A.D.A.M. were nothing more than an electronic cadaver, you could still spend hours with it, learning something new and amazing every ten seconds. Indeed, fancier (and much more expensive) versions of this same program—showing more angles, more layers, and more scientific terminology—are sold to doctors and med students. This home version, however, comes with its own exclusive feature: 50 narrated, beautifully animated slide shows. They cover, for example, the 12 major body systems, narrated by Adam and Eve with laugh-out-loud corniness. (The humor usually comes at poor Adam's expense; for example, the concept of pain is illustrated by a beesting on his nose.)

OK, OK, this isn't the program to consult when you think there's something wrong with you. And the intellectual level won't satisfy the local Mensa members. But you'd be hard-pressed to unearth a clearer, better illustrated, more entertaining way to learn about your *other* favorite machine (after the Mac, that is).

(I also enjoyed perusing a prerelease copy of Adam and Eve's similarly witty and informative next production, a new CD called the The Nine Month Miracle. Can you guess what it's about, baby?)

Family Doctor 3.0

Ever hear the term *shovelware?* That's when CD-ROM creators, petrified by the yawning 600MB emptiness of the disc they must fill, resort to piling pounds of previously published product onto it, without terribly much concern about its quality or integration.

The meat of this disc is composed of newspaper columns by Allan Bruckheim, M.D. ($29.99 company's estimated price; Creative Multimedia, 503/241-4351). Unfortunately, that means you get phrases like "Exercises are very difficult to prescribe in this column, without the drawings." Um, Dr. Bruckheim? This is multimedia. If you can't illustrate an exercise here, then it can't be done.

Dr. Bruckheim's writings have other problems, too, especially grammatical errors and a tendency to simplify medical matters for his newspaper audience. Nor are the programmers of this disc what you'd call perfectionists, either. They chose HyperCard as the basis of the program, which makes everything nice and slow. Some icon buttons and menu commands don't work; you can't bring a text window forward to read it (the search-results window floats stubbornly on top); and the 300 illustrations are dumped in a folder, with no links to the articles (or anything else).

Of course, this disc offers other stuff to do besides reading old newspaper columns. There's a pretty good (but small and nonresizable) anatomy window, vaguely reminiscent of A.D.A.M.; a guide to drugs (listed by chemical name, not brand name); and, inexplicably, a guide to 900 rare diseases (with no corresponding database of common ones). Trouble is, each of these databases was provided by a different company, and there are no links from one to another. You feel less like you're visiting the family doctor, and more like you're rooting through arbitrary folders in his file cabinet. Both the company and I have high hopes for the improvements slated for the new version due in October 1995.

HouseCall 1.5

Of the programs I reviewed, only one took the tack I thought all would take: a medical database. You tell it your symptoms, and it tells you what ailments you might have, ranked by likelihood. Click on another button, get told more about it.

That's the heart of HouseCall ($89.95; Applied Medical Informatics, 801/464-6200). This isn't a CD-ROM, although it does consume 12 megs of your hard drive. And there are no videos or narrators, either; this program is pure text, spiced up by drawings here and there. In addition to the automatic-diagnosis feature, HouseCall also tells you about unexpected interactions between drugs, what each medical test costs and feels like, what to do in the event of poisoning, and so on. The program is simple to use, plenty quick, and sharp-looking.

The problem, of course, is that a computer program can't possibly ask the right questions, nor poke you in the prop-

er places, to arrive at an accurate diagnosis; doctors devote decades learning to do that. And sure enough, this program makes a few mistakes, according to a doctor who checked it out with me. Ironically, that's another problem: the program is frantically self-aware of its own fallibility. You endure its disclaimers everywhere, most annoyingly before you're permitted to see the results of each symptom analysis.

Nonetheless, I'm a lot happier facing life with information on those 1250 diseases at my fingertips than without it. Sure, I might irk some doctor someday by blurting out some piece of erroneous wisdom provided by this program. But hey, what're second opinions for?

Anatomist 2.2

For a CD-ROM on the market in 1995, it's a little weird that its 400 drawings (of 2500 body parts) are all in black and white. Furthermore, this program is, alas, built upon the sluggish HyperCard. Without QuickTime movies and corny jokes by dueling hosts, how can it hope to compete with, for example, A.D.A.M.?

Well, for one thing, Anatomist is aimed at college-level anatomy students, not the family of four gathered around the Performa ($295; Folkstone Design, 604/886-4502). For another, its flash card–like interface permits molecular, cross-section, and interior views of bodily structures, which are beyond the scope of A.D.A.M. Another plus: you get to hear every anatomical term pronounced. If you wish, a little information window floats above the drawing, describing the element you've just clicked on.

And speaking of flash cards: no body part is identified until you click on it, making Anatomist an ideal study tool. Boy, do I wish I'd had this thing in college. And boy, do I wish they'd add color.

The Upshot

With so much changing so fast in modern medicine, the CD-ROM isn't such a bad format for keeping up, 600MB at a time. The healthiest choices are the authoritative Family Health Book, the ingenious and entertaining A.D.A.M., and the hypochondriac's ultimate fantasy, HouseCall.

Actually, my mind was somewhat blown by these programs—1250 diseases? And 2500 body parts? Man, I'm amazed we function at all. **m**

Contributing editor DAVID POGUE wrote the Macintosh best-seller *Macs for Dummies*, third edition (IDG Books Worldwide, 1995). At Yale, he was premed until about 20 minutes into his first organic-chemistry class.

Experts Agree... Virex® Is Clearly Number One!

MW EDITORS' CHOICE
Macworld July 1994
Virex®

♦♦♦♦
MacWeek June 1994
Virex Administrator™

MW ★★★★
Macworld May 1994
Virex®

Virex with SpeedScan™ is number one because it's the fastest, most accurate virus protection. It's the only product Macworld Magazine found that protects against every Macintosh virus and Trojan horse. Macworld Magazine said that patent-pending SpeedScan technology "... puts it ahead of the pack." Now it's faster with native Power Macintosh support! Virex proactively protects your Macintosh, even scanning compressed files, and can instantly be updated for new viruses. Optimized for compatibility, Virex provides the most complete, easy-to-use protection.

For network virus protection, Virex Administrator™ remotely installs and updates Virex, scans for viruses on any networked Macintosh, and provides immediate notification of virus attacks. It even repairs infected files — all from one central location!

Virex. It's the fastest, most complete protection ever. Just ask the Experts.

DATAWATCH 508-988-9700 ©1994 All rights reserved. Datawatch and Virex are registered trademarks and SpeedScan and Virex Administrator are trademarks of Datawatch Corporation. Other company and product names are trademarks of their respective owners.

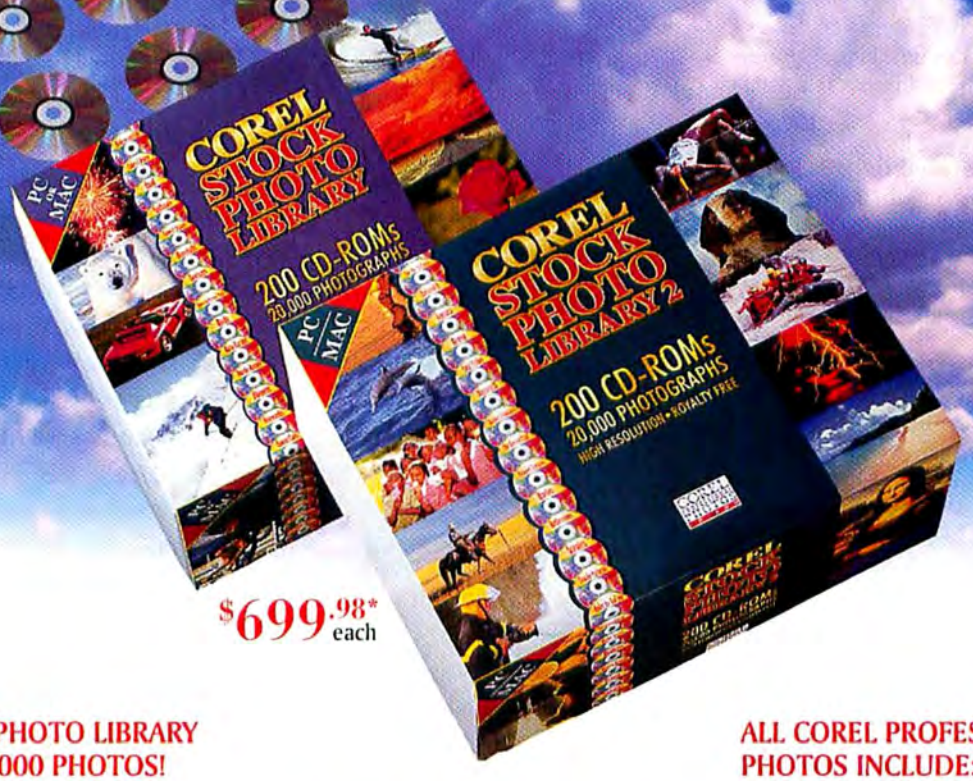
Put Our List On Your List

Our list is the *Consumer Information Catalog*. It's free and lists more than 200 helpful government booklets. So send for the free *Catalog*. It's the thing to do. Write:

Consumer Information Center, Dept. LL, Pueblo, CO 81009

A public service of this publication and the Consumer Information Center of the U.S. General Services Administration

40,000 PHOTOGRAPHS!



$699.98* each

EACH STOCK PHOTO LIBRARY INCLUDES 20,000 PHOTOS!

- **Corel Visual Database** - Search for specific images from the 20,000 photographs available using descriptive keywords
- **Full-Color Reference Manual** - Displays all 20,000 photographs

HUNDREDS OF INDIVIDUAL TITLES

- 100 stunning photos on each CD-ROM

$18.98* each

BEST Home Office BUY

VOLUME SETS

- 2,500 photos on 25 CD-ROMs
- Full-color reference guide
- 13 different volume sets available

$139.98* each

COREL STOCK PHOTO LIBRARY

High Resolution & Royalty Free
Kodak Photo CD Format
Mac & PC Compatible
Ideal for Desktop Publishing

ALL COREL PROFESSIONAL PHOTOS INCLUDE:

- Corel Photo CD Lab
- Corel Mosaic Visual File Manager
- Corel Artview Screen Saver
- Corel CD Audio
- Windows Wallpaper & Flipper

- **HIGH RESOLUTION** - 5 resolutions from 128 X 192 up to 2048 X 3072 Each image is approximately 18 megs (uncompressed)
- **COLOR FUNCTIONALITY** - Grayscale, 16 colors, 256 colors or RGB (24 bit)
- **EXPORT FILTERS** - Macintosh: TIFF or PICT. Windows: TIF, BMP, EPS, PCX or GIF
- **COMPATIBILITY** - Can be read by any CD-ROM player (XA support not needed)

Also available from Corel:

COREL GALLERY 2 FOR MACINTOSH

- 15,000 clipart images and symbols
- 500 fonts
- 75 sound clips
- 10 QuickTime™ movies
- A multimedia file manager

$64.98* each

KLR-0124

$ ATTENTION $
PROFESSIONAL PHOTOGRAPHERS!
If you are a professional photographer interested in having your photographs published in the world's leading photo CD-ROM collection, please call Corel Corporation at:
1-613-728-0826 ext. 85080

COREL
Call now for faxed literature!
1-613-728-0826 ext. 3080
Document #1039

The Mac Zone™ Established 1986
1-800-258-2088
Source code 1719

*US$ plus applicable taxes.

Circle 78 on reader service card

BY DEBORAH BRANSCUM

Readers Roar Back

Retailers and shoppers report on the hazards of Mac purchases

AS A CONSUMER COLUMNIST, my task is pretty simple: I try to give you information that will help make buying or using a Macintosh easier, less expensive, or more worthwhile. Sometimes I do this by researching purchases and examining the benefits and drawbacks of buying through independent stores, large chains, and mail order. Such a comparison recently hit a nerve among more than 60 readers and a couple of retailers. One quickly zapped me with several pointed electronic missives after reading about my experiences in shopping for new Macs ("The Buying Game," *Conspicuous Consumer*, April 1995).

"I read your article about the great service you received at ComputerWare," wrote Wally Glenn, a salesperson at a mostly Mac computer store in Seattle. "I noticed that despite the better service you got there, and the fact that they were willing to match prices, you decided that it was better to drive way out of your way or order way across the continent than to continue doing business with a Mac store that you were happy with. You just summed up the reason why there are few Mac-only stores left."

In fact, I got acceptable but not great service at ComputerWare, a store I like very much—but never mind; Glenn was on a roll. "We get people like you all the time who come in, ask all their questions, then go down to the warehouse store to make the purchase. Why? Because it was cheaper. . . . When you go out to dinner to a nice restaurant, do you whip open the menu, point to the filet mignon, and tell the waiter point-blank, 'I can get this cheaper down the street at Denny's. Now, are you going to match their price?' ? . . . Yet you walk into the computer store and act like a jerk demanding that we slash the price or you're going to walk. . . . You will eagerly buy [a Mac] from some big, unfriendly chain from some teenager making $6 an hour."

Glenn is willing to say on the record what other independent Mac retailers will merely whisper. According to these professionals, penny-pinchers like me may put them out of business. They argue that customers who require more personal attention should be willing to pay for it. How much more? The difference can be small or sizable. For a Hewlett-Packard DeskWriter 540, for example, some chain stores charge customers only $5 over their cost, while another store might charge an additional $40 or more.

For their extra cost, customers at his store get a smart staff and good support, according to Glenn, who was helping an established customer when I called to ask permission to quote from his E-mail. This woman had bought from Glenn earlier but bought her new Mac by mail to save money. When problems arose, she went back to Glenn hoping he could help.

As Glenn put it in one E-mail, "I know the consumer is saving more money than ever before. This comes at the expense of no technical support, no knowledgeable sales staff, no service department with the latest drivers and bug-fixes. In a very real way, the consumer is really getting ripped off."

Shoppers' Hell or Paradise?

Are consumers being ripped off? Some certainly seem to feel that way. The response to my April column was far greater than any of my previous columns ever received. More than 40 comments were specific to CompUSA. Several were from people who were happy with the country's oldest computer superstore. A reader in Pennsylvania said he went back to the King of Prussia store to buy a Power Mac because he was treated so well when he bought his first Mac. But the vast majority of letter writers were deeply dissatisfied with their local stores.

CompUSA is the largest computer superstore, with 83 stores in 41 cities in 26 states. Because the chain is so large and does so much business, it's an easy target for criticism. And because the *Macworld* readers I heard from are a self-selected bunch, it's impossible to draw conclusions from their reports that are in any way statistically valid. Nevertheless, it was disheartening to hear that the atmosphere I found at CompUSA's Emeryville, California, store was not unique.

A network manager from Massachusetts, for example, reported that she used to recommend her local CompUSA in Woburn to coworkers because of its great displays and extensive merchandise. But on a recent trip to the store she found that "all of the Mac hardware (or what was left of it) had been shoved into one little corner of the floor, behind the printer and SCSI cables. They now carried only Performas and a few leftover 630s. The only printer on display was an HP DeskJet."

Other readers also complained about lackluster help from the sales staff, suspect advice, limited merchandise, and out-of-date software. As one dissatisfied soul from Louisiana wrote, "Their service, selection, heck, their whole store is Mac-unfriendly and I don't want to spend my hard-earned money in a store that doesn't appreciate me or my computer."

That sentiment was echoed by a Mac

continues

JOHN RITTER

MAY THE SOURCE BE WITH YOU

Don't let the dark forces of ignorance defeat you. Right in this galaxy, you can tap into the source -- the free Consumer Information Catalog. It lists free and low-cost government publications on cosmic topics such as federal benefits, jobs, health, housing,

educating your children, cars, and much, much more. So dispel the darkness and send for the source. Write today to Pueblo, Colorado for the free Consumer Information Catalog. Just send your name and address to :

Consumer Information Center
Department Source
Pueblo, Colorado 81009

professional from Long Island, New York, who went shopping with a friend, hoping to strike up a good deal in buying two 500MB to 700MB hard drives together. "There was a Mac section, but it didn't even have any 28.8-Kbps modems," he wrote. "The software section was minuscule compared to the Wintel sections, but that was expected. What wasn't expected was the low level of helpfulness and knowledge on the part of the staff, including the so-called Mac people, who couldn't have been less helpful or knowledgeable. When we went to the counter where the internal hard drives were kept and asked if certain drives could be installed in our computers, we were told that, basically, they didn't know and didn't care to try and find out.

"We went home, sobered by the experience, feeling like MacLepers in a DOS/Windows world. We ended up ordering drives from APS and Spin, both of whom were helpful, knowledgeable, and shipped overnight."

Witnesses for the Defense

Is the entire CompUSA chain Mac-unfriendly? Not according to several *Macworld* readers, who, like the Pennsylvania reader, cited low prices and, in some cases, good service as reasons to buy there. One defender of the chain was a Macintosh hardware/software representative of a CompUSA in Florida.

The Florida store has five salespeople dedicated to Macintosh service and support and carries all Mac models that are supported through the retail channel. Staffers "are ready and glad to demonstrate to customers anything from At Ease to Director (much unlike our Wintel counterparts, who have the challenge of simply keeping up with new 'standards' and drivers)," according to the rep. "We also handle tech-support calls on the floor for people, even if they didn't purchase their systems here. Our way of thinking is, the greater the number of happy Macintosh users out there, the more the word of how great Apple's machines are will get around."

Larry Mondry, CompUSA's genial executive vice president for general merchandise, also leaped to the chain's defense. Mondry pointed out that several CompUSA stores do a brisk business in Mac sales and that the chain has no wish to alienate Macintosh users and doesn't care what type of computer customers buy, as long as they buy from CompUSA.

"CompUSA's intention is to have the right products at the right place at the right time with the right staff," said Mondry. "Achieving the goal is the challenge of all retailers." Mondry said the company's share of Mac business has grown in the past year. And the company hopes to do even better by working with Apple toward improvement. He conceded that CompUSA should not carry outdated software. "We carry software based on a customer's desire to buy it," he said. "Sometimes we err. We're human."

CompUSA's current software shortcomings should improve, according to Mondry. "In the heavy Mac markets, we want to have the best software selection available for the retail buyer. . . . We believe we've got great opportunity in software, because no one company has done a very good job at retail of offering Macintosh software."

That's a big part of why, compared with PC users, so many more Mac users buy software by mail, Mondry says. Can CompUSA go from a skimpy Mac software selection to the best in the business? Let's give 'em six months and then see.

The Buying Game Redux

Mail-order thrives because established companies provide good service at low cost. I expect that readers will continue to buy by mail, as well as patronize chain stores and buy from independents. Mac buyers, like human beings everywhere, use the fierce competition among computer dealers and mail-order companies to save themselves some money. That means salespeople like Wally Glenn will have to keep fighting to convince their customers that paying more for a Mac can be a good investment. **m**

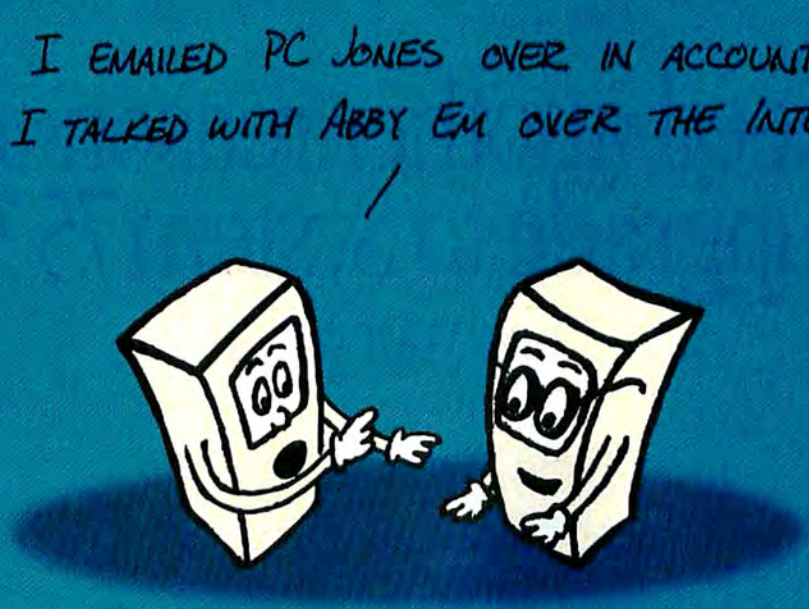
SERVICE HERO

Deborah Cowder of Oakland, California, writes to praise Berkeley, California–based CJS Systems. CJS came to her rescue when the floppy drive in Cowder's PowerBook 180c died one day before she was leaving on a trip. "I called CJS at 11 a.m. They said to bring it in. I did; they diagnosed it and then replaced the floppy drive while I waited! All told, it took about one hour."

You can write to contributing editor DEBORAH BRANSCUM, *Macworld*'s Conspicuous Consumer, at *Macworld*, 501 Second St., San Francisco, CA 94107, or via the Internet (**branscum@aol.com**).

Send nominees for sainthood to *Service Heroes*, *Macworld*, 501 Second St., San Francisco, CA 94107. Also, drop *Conspicuous Consumer* a line if a company is ignoring you.

The power of Macs on the Internet—See it live at Mactivity'95



Got Macs? Want them to talk? Attend Mactivity'95!

MACTIVITY'95 IS THE ONLY conference focused on connecting the Macintosh to the computer universe. Come and see key Internet, cross-platform, workgroup computing and LAN solutions and more at Mactivity'95.

Use this ad and you can attend all the hottest features of Mactivity—including the Product Showcase with over 100 vendors, daily keynote addresses and Internet lectures—*for free!* Simply mail or fax the coupon on the lower right or bring it to the show for your free Showcase*Extra* pass.

Daily lectures (FREE with this ad)

In addition to meeting over 100 vendors, attending insightful keynote addresses and trying the hottest products in the Mactivity Test Drive Area, your Showcase*Extra* pass gets you into the Technology Theater where you'll hear the latest on topics such as:

- **Doing Business on the Internet**
- **Benefits of Networking for Small Businesses**
- **Getting the Most from Email**
- **Using the Mac as a WWW server**

Daily keynote addresses (FREE with this ad)

- **"No, that's not a bad file. It's encrypted!" The Future of Encryption Technologies**
  Bill Hancock, Vice President, Network-1
- **Macintosh: The Universal Communication Client**
  Allen White, Director of the Advanced Technology Group, Apple Computer, Inc.
- **Apple's Internet Story: Servers, Clients and Communications**
  Ike Nassi, Vice President, Apple Computer, Inc.

Other highlights include:

- **Special pavilion—internet@mactivity**
- **Over 100 exhibitors**
- **Connect the Computer Universe game—win fabulous prizes!**
- **Mactivity Show Network and Test Drive Area**

And it's all FREE with this ad!

Simply mail or fax the coupon on the right for a free Showcase*Extra* pass. Without it, on-site registration is $20.

Register for the full conference

Spots are still available for the full Mactivity conference. Register for the full conference and choose from over 50 technical sessions to get you up to date on the latest developments on the Internet, networking and communication. Sign up by May 31 and save $100! Call for complete session descriptions or browse them on our www page at http://www.mactivity.com.

Mactivity'95
THE MACINTOSH CONNECTIVITY CONFERENCE

San Jose Convention Center
San Jose, California
July 11–13, 1995

☐ Send me a 12-page conference catalog.
☐ Send me a free Showcase*Extra* pass.

Name _____

Title _____

Company _____

Address _____

City, State, ZIP _____

Tel _____

Fax _____

Email _____

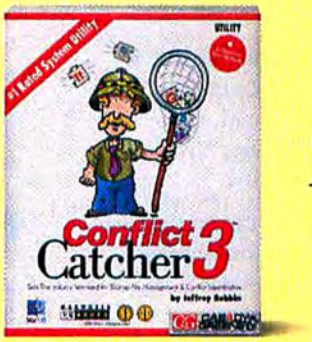
Mail to Mactivity, 20 N. Santa Cruz Avenue, Los Gatos, CA 95030, fax to 408.354.2571 or email to info@mactivity.com.

For more information, call 408.354.2500, toll-free 800.798.2928, or browse http://www.mactivity.com.

Mactivity'95: The Macintosh Connectivity Conference is an independent conference not affiliated with Apple Computer, Inc. Macintosh and AppleTalk are registered trademarks of Apple Computer, Inc. All other product names are registered trademarks of their respective companies. Sessions subject to change.

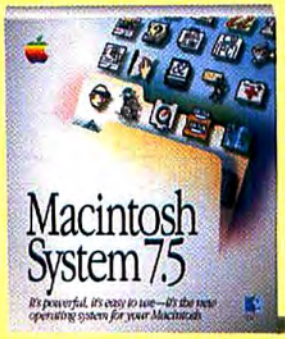
Need another reason to upgrade to System 7.5?
(Take your pick.)

A. Apple Watch



B. Conflict Catcher

It's 7.5 Time. Upgrade to System 7.5 today and get a FREE gift.



There's never been a better time to upgrade to Macintosh® System 7.5. That's because if you buy System 7.5 from May 1 to July 31, 1995, you have your choice of either of these gifts from Apple. The Apple Logo watch or Conflict Catcher 3 from Casady & Greene (suggested retail price $99.95), an award-winning startup manager and problem-solver.

Mac™ OS

More than 1 million people are already taking advantage of the many new features found in System 7.5. Like enhanced printer controls. One-stop access to e-mail, faxing and the Internet. Instant access to DOS and Windows files. And Apple Guide, the interactive help feature that will walk you through every advancement in System 7.5, so you won't get lost. What other possible reason could you ask for?

So what does it take to upgrade to System 7.5? Just stop into your nearest reseller today and ask how you can receive a free gift coupon with your System 7.5 purchase. Call 800-538-9696 for more details or your nearest reseller, or call 800-769-2775, ext. 5770, to order directly from Apple. Take your pick.

Apple

DOS and Windows compatibility requires an Apple SuperDrive. © 1995 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, Apple SuperDrive and Macintosh are registered trademarks of Apple Computer, Inc. Mac and the Mac OS logo are trademarks of Apple Computer, Inc. Conflict Catcher 3 is a trademark of Casady & Greene. Mention of third-party products is for informational purposes only and constitutes neither an endorsement nor a recommendation. All understandings, agreements or warranties, if any, take place directly between the vendors and the prospective users. All Apple products are designed to be accessible to individuals with disability. To learn more (U.S. only), call 800-776-2333 or TDD 800-833-6221.

Editors' Choice

THE BEST PRODUCTS FEATURED IN MACWORLD

Edited by Patricia Carberry-Harris

Macworld Editors' Choice is a complete listing of the hardware and software products selected as the best of their type in *Macworld*'s comparative articles. A ❖ next to a product indicates that we chose more than one product in that category. A ◀ next to a product listing indicates that a native Power Mac version is available.

Hardware

MONITORS

SMALL COLOR MONITORS, Jan 94

14-inch display: ❖ Sony CPD 1430; Sony Corp. of America, 800/222-7669; $779.95.
❖ Nanao FlexScan F340i•W; Nanao USA, 800/800-5202; $799.

15-inch display: NEC MultiSync 4FGe; NEC Technologies, 708/860-9500; company's estimated price $755.

TWO-PAGE COLOR MONITORS, Nov 94

PressView 21 Display System; SuperMac Technology, 408/541-6100; $3999.

NETWORK HARDWARE

REMOTE-ACCESS SERVERS, Oct 94

Mixed networks: NetConnect Remote Access Server; Asanté Technologies, 408/435-8401; $3899 for eight ports.

AppleTalk networks: ARA Multiport Server; Apple Computer, 408/996-1010; four ports $1799, eight ports $3298.

PRESENTATION HARDWARE

PORTABLE PRESENTERS, Jan 95

Z115; nView, 804/873-1354; $5495.

PRINTERS

COLOR PRINTERS, Aug 94

Low-end ink-jet: DeskWriter 560C; Hewlett-Packard, 800/752-0900; $719.

Solid ink-jet: Phaser 300i; Tektronix, 503/682-7377; $9995.

Thermal-wax transfer and color laser: Phaser 220i; Tektronix, 503/682-7377; $5995.

DYE-SUBLIMATION PRINTERS, Jul 94

Prepress proofing—tabloid size/fastest: Phaser 480; Tektronix, 503/682-7377; $14,995.

Prepress proofing—tabloid size/most complete: Rainbow; 3M, 612/733-1110; company's estimated price $20,000.

Prepress proofing—letter size: ProofPositive Full Page; SuperMac Technology, 408/541-6100; $7999.

General publishing and business: Phaser IISDX; Tektronix, 503/682-7377; $9995.

PERSONAL PRINTERS, Sep 94

Ink-Jet: DeskWriter 520; Hewlett-Packard, 800/752-0900; $365.

Laser—$1000 to $1600: microLaser Pro 600; Texas Instruments, 214/995-6611; $1599.

WORKGROUP PRINTERS, Jun 95

Tabloid-size printers: LaserJet 4MV; Hewlett-Packard, 208/323-2551; $3549.

Legal-size printers: ❖ Optra Lx; Lexmark, 606/232-2000; $3298.
❖ LaserWriter 16/600 PS; Apple Computer, 408/996-1010; company's estimated price $2299.

SCANNERS/IMAGE CAPTURE

ELECTRONIC CAMERAS, Sep 94

Apple QuickTake 100; Apple Computer, 408/996-1010; $749. ◀

HIGH-BIT FLATBED COLOR SCANNERS, Mar 95

❖ Arcus II; Agfa, 508/658-5600; $3495.
❖ PowerLook; Umax, 510/651-8883; $3495.

LOW-COST COLOR SCANNERS, Nov 93

$1300 to $1600: ❖ La Cie Silverscanner II; La Cie, 503/520-9000; $1599. ❖ Hewlett-Packard ScanJet IIc; Hewlett-Packard, 800/752-0900; $1599.

Under $1300: Mirror 800 Plus Color Scanner; Mirror Technologies, 612/633-4550; $1299.

OCR, Nov 93

OmniPage Professional; Caere Corp., 408/395-7000; $995. ◀

SYSTEMS/STORAGE

1.3GB OPTICAL STORAGE, Dec 94

Best low-cost solution: 1.3Gig MO; Club Mac, 714/768-8130; $2099.

Best overall performance: Genesis 1300; Microtech, 203/468-6223; $2899.

HIGH PERFORMANCE DRIVE SYSTEMS, Jul 95

Accelerator card: SiliconExpress IV; Atto Technology, 716/691-1999; $995.

Drive mechanism: IBM UltraStar series; IBM (available from several resellers), prices vary by reseller.

QUAD-SPEED CD-ROM DRIVES, Jun 95

APS T3501; APS Technologies, 816/483-6100; $299.95.

HIGH-SPEED HARD DRIVES, Aug 93

2.7GB drives: ❖ Nova XL 2700; Microtech, 203/468-6223; $2999. ❖ Vista 3.5GB; Relax, 510/471-6112; $3499.

SCSI-2 adapter: QuickSCSI; PLI, 800/288-8754; $499.

PC COPROCESSING, Oct 94

OrangePC Model 210; Orange Micro, 714/779-2772; $1283.

RAID STORAGE SYSTEMS, Apr 95

RAID 3 or 5: MR/5 RAID; MegaDrive Systems, 310/247-0006; $18,840.

RAID 0: ❖ Joule RAID; La Cie, 503/520-9000; $2999. ❖ DisKovery 8200W; Optima Technology, 714/476-0515; $7790. ❖ SledgeHammer 2000FMF; FWB, 415/474-8055; $2359.

SYSTEM UPGRADES, Feb 95

Upgrade for Macintosh Quadra 650, 800, or 950: Power Macintosh Upgrade Card; Apple Computer, 408/996-1010; $699.

Upgrade for other 680X0 Macs: Replace with Power Macintosh 6100/60 with CPU booster and cache card. Power Macintosh 6100/60; Apple Computer, 408/996-1010; $1819 (base system with 8MB of RAM). PowerClip (CPU booster); Newer Technology, 316/685-4904; $245. 256K cache card; various companies, roughly $200.

VIDEO/DISPLAY

24-BIT VIDEO CARDS, Apr 94

Inexpensive acceleration: PrecisionColorPro 24XP; Radius, 408/434-1010; $599.

Full-featured acceleration: Thunder II GX•1360; SuperMac Technology, 408/541-6100; $4499.

HIGH-END VIDEO EDITING, Jun 94

Presentation video: ❖ MoviePak2 Pro Suite; RasterOps, 801/785-5750; $4199. ❖ VideoVision Studio; Radius, 408/434-1010; $4499.

Corporate video (offline): Media Composer 400s; Avid Technology, 508/640-6789; $14,995.

Corporate video (online): VideoCube; ImMix, 916/272-9800; $40,500.

PHOTOSHOP ACCELERATORS, Apr 94

PhotoBooster; Radius, 408/434-1010; $999.

continues

MACWORLD Editors' Choice

Software

ACCOUNTING/FINANCE

GROWING A SMALL BUSINESS, Nov 93
Small-business system: M.Y.O.B.; Best Ware, 201/586-2200; $199.
Home office/personal finance: MacMoney; Survivor Software, 310/410-9527; $119.95.

BUSINESS TOOLS

PORTABLE-DOCUMENT SOFTWARE, Apr 95
Document Distribution: Common Ground 1.1; No Hands Software, 415/802-5800; $189.95.

STATISTICS, Oct 93
Exploratory data analysis: DataDesk 4.1; Data Description, 607/257-1000; $595.
Comprehensive package: SYSTAT 5.2.1; SYSTAT, 708/864-5670; $895.

CD-ROM

TOP 10 CD-ROMS, Mar 94
Overall: Seven Days in August; Time Warner Interactive Group, 818/955-9999; $79.99.

COMMUNICATIONS/NETWORKS

COMMUNICATIONS SOFTWARE, Aug 94
Basic connectivity: ZTerm; David P. Alverson (no phone number available); $30.
Terminal emulation: Crosstalk for Macintosh; Digital Communications Associates, 404/442-4000; $195.
Internet exploration: VersaTerm; Synergy Software, 215/779-0522; $125.

DOS WINDOWS EMULATION, Oct 94
Timbuktu Pro 1.0.3 for Macintosh, Timbuktu 1.1 for Windows; Farallon Computing, 510/814-5000; $199 each.

NETWARE CONNECTIVITY, Sep 93
NetWare for Macintosh; Novell, 801/429-7000; $495 for 5-user license to $2295 for 200-user license.

PROTOCOL ANALYZERS, Jul 94
EtherPeek, AG Group, 510/937-7900; $795.

TERMINAL EMULATOR, Oct 93
VersaTerm; Synergy Software, 215/779-0522; $149.

GRAPHICS

3-D MODELING, Dec 94
Stand-alone modeler: formZ; autodessys, 614/488-9777; $1495.
Integrated-modeling package: Strata StudioPro; Strata, 801/628-5218; $1495.
Entry-level modeler: Infini-D; Specular International, 413/253-3100; $695.

CLIP ART'S GREATEST HITS, Jan 94
Overall collection: ❖ ClickArt Studio Series; T/Maker Company, 415/962-0195; $99.95 per volume.
❖ Electronic Clipper subscription service; Dynamic Graphics, 800/255-8800; $67.50 per month.
❖ Images with Impact series; 3G Graphics, 800/456-0234; $99.95 to $129.95 per volume, CD-ROM $499.
❖ Metro ImageBase Electronic Clip Art; Metro ImageBase, 800/525-1552; $74.95 per volume, CD-ROM $149.95.
❖ Typographers' Ornaments; Underground Grammarian, 609/589-6477; $25 per volume; ten TIFF albums $200; EPS volumes $50 each.

DRAW PROGRAMS (LOW-COST), Sep 93
Budget draw: Expert Draw; Expert Software, 305/567-9990; $49.95.
Budget draw/paint: UltraPaint; Deneba Software, 305/596-5644; $79.
Beginners' program: Aldus SuperPaint; Aldus Consumer Division, 619/558-6000; $149.95.
Overall: Canvas; Deneba Software, 305/596-5644; $399.

FONT BUYERS' GUIDE, Mar 94
Text-face collection: Type On Call CD-ROM; Adobe Systems, 415/961-4400; $99 (this price includes the ability to unlock two families from preselected packages); an additional $25 enables you to unlock individual faces, or $69 to $179 for unlocking families.
Display/decorative-face collection: Fontek; Letraset, 201/845-6100; $39.95 per face.
Bargain collection: Monotype ValuePack; Monotype, 312/855-1440; $89 for 57 fonts.

IMAGE DATABASES, Oct 93
❖ Aldus Fetch 1.0; Adobe Systems, 206/628-5739; $295.
❖ Multi-Ad Search 2.0; Multi-Ad Services, 309/692-1530; $249.

IMAGE EDITORS, Feb 95
Adobe Photoshop 3.0; Adobe Systems, 415/961-4400; $895.

INTEGRATED SOFTWARE

INTEGRATED SOFTWARE, Feb 94
ClarisWorks; Claris Corporation, 408/727-8227; $299.

ONLINE SERVICES

ONLINE SERVICES, Aug 94
E-mail: America Online; America Online, 703/893-6288; basic monthly fee $9.95.
Reference: CompuServe; CompuServe Information Service, 614/457-0802; basic monthly fee $8.95.

ORGANIZATION/PRODUCTIVITY

GRAPHING SOFTWARE, Aug 94
DeltaGraph Pro 3 3.0.4; DeltaPoint, 408/648-4000; $195.

SALES-AUTOMATION SOFTWARE, Oct 93
❖ Contact Ease; WestWare, 619/274-5053; one user $395, five users $1495.
❖ CBS; Colleague Business Software, 512/345-9964; $495.

TEXT-RETRIEVAL SOFTWARE, Dec 93
Small system: On Location; On Technology, 617/374-1400; $129.
Multiuser system: Personal Librarian; Personal Library Software, 301/990-1155; $995.

PRESENTATION TOOLS

PRESENTATION SOFTWARE, Jul 94
Persuasion 3.0; Adobe Systems, 206/622-5500; $495.

UTILITIES

BRAVE NEW DOCUMENTS, Jan 94
Application-independent document distribution: Common Ground; No Hands Software, 800/598-3821; $189.95.
Book-length documents: FrameReader; Frame Technology, 800/843-7263; $84.95.

PRINTING, Sep 93
PC-printer cable packages: PowerPrint; GDT Softworks, 604/291-9121; $149.

VIRUS KILLERS, Jul 94
Commercial software: Virex; Datawatch, 919/549-0711; $99.95.
Free software: Disinfectant; free from various online services.

VIRTUAL MEMORY SOFTWARE

VIRTUAL MEMORY, Jun 94
Virtual memory software: Virtual 3.0; Connectix Corp., 415/571-5100; $99.
Memory-boosting software: RAM Doubler 1.0.1; Connectix Corp., 415/571-5100; $99.

WORD PROCESSORS

HIGH-END WORD PROCESSOR (for fast 68040 Macs and Power Macs), Mar 95
Microsoft Word 6.0; Microsoft Corporation, 206/882-8080; $325.

LOW-COST WORD PROCESSOR, Mar 95
MacWrite Pro; Claris Corporation, 408/727-8227; $99.

Vendors: Please write to *Macworld Editors' Choice*, 501 Second St., San Francisco, CA 94107, or send a fax to 415/442-0766 to inform us of changes in your phone number or your product's list price.

Star Ratings

HARDWARE AND SOFTWARE REVIEWS AT A GLANCE

Edited by Wendy Sharp

Macworld Star Ratings lets you compare Macintosh products by providing summaries of *Macworld*'s authoritative product reviews from the past year. The number of stars indicates quality; our reviewers assign five stars to outstanding products and one star to poor ones. The ◀ symbol indicates that a product is available in a native Power Mac version.

If a product has been upgraded since our last review, the most recent version number supplied by the vendor appears in parentheses after the reviewed version number. To read a full review of any product in the listing, please consult the issue listed at the end of each synopsis.

Vendors: Please write to *Macworld Star Ratings*, 501 Second St., San Francisco, CA 9410 to inform us of changes in the version number or list price of your product, or of changes to your phone number.

Software

BUSINESS TOOLS

★★★ **AccuZip6 1.8.7, Software Publishers, 800/233-0555, $689.** Bulk-mail software has informative progress indicators, batch and individual processing, low rates, and flexible parsing during import, but the interface is incomprehensible. Sep 94

★★ **Adobe Acrobat 2.0, Adobe Systems, 415/961-4400, $195.** The font fidelity of this portable-document software is uneven, and the software demands too much in resources compared with other portable-document programs. Mar 95

★★★ **Adobe Acrobat for Workgroups 2.0, Adobe Systems, 415/961-4400, $1595.** As a collaboration tool, this software is relatively inexpensive and offers well-done annotation tools. However, it's resource-intensive, and creating hypertext documents with it isn't easy. Mar 95

★★★★ **BizPlan Builder 5.0, Jian, 415/254-5600, $129.** To create a comprehensive business plan, just fill in the blanks in this easy-to-use spreadsheet/word processor template. Jun 95

★★ **Bulk Mailer CASS 1.00d (1.3), Satori Software, 206/443-0765, $150.** Unattended operation is possible with this bulk-mail software, but batch processing is slow and the program has coding problems. Sep 94

★★★ **Business Plan Writer 6.0, Graphite Software, 301/984-1100, $99.** This proposal-writing template can help entrepreneurs create a detailed business plan, but—unlike the competition—it won't help them format an attractive presentation. Jun 95

★★★ **CA-Cricket Graph III 1.52 (1.53), Computer Associates International, 516/342-5224, $129.** Graphing software's features are just right for charts in the physical and social sciences, but lack pizzazz. The program is easy to learn and use, and includes math features for data transformations and curve fitting. Dec 94 ◀

★★★★ **ClarisWorks 3.0, Claris Corp., 408/727-8227, $129.** Inexpensive, easy to use, and powerful integrated software is the best package available. It's far better in terms of features, speed, integration, and use of system resources than its competition. Frugal use of RAM makes it a good choice for owners of older Macs. Feb 95 ◀

★★★★ **Crystal Ball 3.0 (3.0.1), Decisioneering, 303/449-5177, $295.** Compact business-simulation software is fast enough for complex projects and can pay for itself in disaster-avoidance in a variety of business tasks. Oct 94

★★★★ **Decision Analysis 2.5, TreeAge, 617/536-2128, $379.** Decision-assistance software handles complex business cases by constructing tree diagrams of probabilities and payoffs. It offers a type of modeling that is more realistic and easier to modify than other options. Nov 94 ◀

★★★ **Extend+BPR 3.0 (3.1), Imagine That, 408/365-0305, $990.** Business-modeling software includes superior templates for business-process reengineering, but some programming experience is helpful. Oct 94

★★★ **FastTrack Schedule 2.1 (3.0), AEC Software, 703/450-1980, $299.** Simple project-management software is ideal for managers who need to put together a schedule quickly and easily, but if you require more power to manage conflicts between multiple projects and resource allocation, you'll need a more comprehensive program. Sep 94 ◀

★★★★ **Helix Express 2.0.1 (3.0), Helix Technologies, 708/465-0242, $589.** Icon-based relational-database software's improved performance makes it a serious competitor for all-Mac networks. Especially notable is its much faster speed; multiuser operation is downright snappy. Jul 94 ◀

★★★ **InfoDepot 2.0 (2.3), Chena Software, 610/770-1210, $295.** All-in-one program for project planning includes tools for brainstorming and organizing ideas; scheduling project steps; and entering, calculating, and presenting data. It does a good job but has some flaws. Jan 95

★★★★ **MarcoPolo 3.0, Mainstay, 805/484-9400, $895.** Full-featured document-management system is significantly improved. The addition of OCR—both the handling of unrecognized words and the ability to batch-process TIFF files with OCR—make it very usable. Jan 95

★★★ **MicMac 2.0v1, Nirvana Research, 408/369-1200, $89.** The concept of Mac as dictation machine is undeniably attractive, and Nirvana Research has pulled it off well. It takes lots of hard drive space to save recordings, though. Nov 94

★★★★ **Microsoft Excel 5.0, Microsoft Corp., 206/882-8080, $339.** Although the feature set of this Power Mac spreadsheet is stunningly rich, the system requirements for a full install are jaw-dropping, including 27MB of hard drive space plus 24MB of RAM without virtual memory. Still, it is relentlessly complete. Jan 95 ◀

★★★ **Microsoft Works 4.0, Microsoft Corp., 206/882-8080, $99.95.** Although this isn't the best integrated package around, it's a sensible, low-cost choice. It provides users with a respectable word processor, database, spreadsheet, calendar, and address book, as well as a slide-show module, and drawing and communications tools. Jan 95 ◀

★★★★ **OmniPage Professional 5.0, Caere Corp., 408/395-7000, $695.** In a historic first for OCR, this Power Mac software has an accuracy of 100 percent on good text samples. It does still make occasional baffling minor errors on real-world documents. Nov 94 ◀

★★★★ **Pablo 2.0.1 (2.0.4), Andyne Computing, 613/548-4355, $695.** Effective end-user data-reporting tool creates a considerable workload, but sidesteps the hassles of SQL data access and produces great reports with minimal effort. Jul 94

★★★ **Street Atlas USA 2.0, DeLorme Mapping, 207/865-1234, $79.** For the most part, this geographical information software delivers what it promises at a great price. Oct 94

★★★ **TeamFlow 3.1, CFM, 617/275-5258, $295.** Total Quality Management flowchart software is a valuable business tool. Its report printing and customizability are limited, however. Nov 94

★★★★ **TopDown 4.0 (4.1), Kaetron Software Corp., 713/298-1500, $345.** Flowcharting program's support for custom symbols and automatic drawing aids, along with its ability to let you easily create and navigate lower-level charts, make it a productive tool. Jul 94

★★★★ **ZipZapp 1.0 (2.0), True Basic, 603/298-8517, $34.** You can use this data-reference utility to find an area code, the correct spelling of a city's name, and more. The interface is intuitive, and the cost, low. Oct 94 ◀

★★★ **ZP4 12.1 (14.4), Semaphore Corp., 408/688-9200, $125.** Inexpensive bulk-mail software supports batch and individual processing, but the progress indicators are uninformative, and unattended operation requires extra work. Sep 94

COMMUNICATIONS/NETWORKS

★ **BLAST Professional, BLAST Inc., 919/542-3007, $139.** Our reviewer could not get this telecom software to work reliably and consistently during his tests, and found the minimalist and quirky interface frustrating. Jan 95

continues

Star Ratings

★★ **HoloGate 1.0, Information Access Technologies, 510/704-0160, $500.** Two unique features—UUCP and Usenet news distribution—are the primary reasons to consider this product. Otherwise, it comes up price-rich and feature-poor. **Apr 95**

★★ **The Internet Companion, The Voyager Company, 914/591-5500, $29.95.** This well-written, HyperCard-based electronic book offers less information than others. Internet access is available through accompanying software, but it's a terminal-emulation screen. **Dec 94**

★★★★ **Internet Explorer Kit and Internet Starter Kit, Hayden Books, 317/581-3500, $29.95 each.** Well-written books and useful software combine to produce one of the best introductions to the Internet available for Mac users. **Dec 94**

★★★★ **Internet Membership Kit 1.0 (2.0), Ventana Media, 919/942-0220, $69.95.** If you need access to the Internet, this book and software combination is a good package. The best part about it is its included preconfigured software. **Dec 94**

★★★ **MicroPhone Pro 2.0 (2.1), Software Ventures Corp., 510/644-3232, $195.** The new feature set of this communications package includes multiple sessions, faxing, TCP/IP networking, and more, but it is a mixed bag. Not all the features are well integrated, although some are innovations for which users will be grateful. **Oct 94**

★★★★ **Netscape Navigator, Netscape Communications Corporation, 415/528-2555, $39.** World Wide Web browser is well ahead of the competition in terms of features, stability, and ease of use. Although its E-mail features could use some improvement, it's the best way to surf the Net. **May 95**

★★★★ **NetWorks 3.0.4, Caravelle Networks Corp., 613/225-1172, $1395 to $2495.** For networks that sprawl across buildings or states, this network-monitoring utility is an indispensable tool. It continually polls devices, checking CPUs, routers, printers and hubs for signs of life. **Apr 95**

★ **PowerShare Collaboration Servers, Apple Computer, 408/996-1010, $999.** Before this collaboration software will be ready for prime time, Apple needs to overhaul the complex Admin application, add serious diagnostic aids, provide comprehensive documentation, and offer knowledgeable technical support at a price less than that of the program itself. **Aug 94**

★★★ **QuickMail 3.0, CE Software, 515/221-1801, $199 to $3799.** If you're shopping for a first-time E-mail application, this product is a good choice for ease of use and setup. The most promising new tool, rules-based messaging, lacks some important features. **Jan 95**

★★★ **RunShare, Run, Inc., 201/529-4600, $199 to $2499.** System extension endeavors to pump up file-transfer speeds across both local- and wide-area networks. It offers twofold to threefold throughput gains for fast Macs and large files but is less useful with small files or slow Macs. **Feb 95**

★★ **SoftWindows 1.0, Insignia Solutions, 415/694-7600, $499.** You can run Windows software on a PowerMac with this emulation software, but although it's a viable solution, you pay the price in terms of performance, compatibility, and actual cost. **Aug 94**

★★★★ **White Knight 12.0, The FreeSoft Company, 412/846-2700, $139.** While this telecom software can be bewildering, it works impressively well. If you are willing to read the manual from cover to cover, the program may become your favorite telecom tool. **Nov 94**

DESKTOP PUBLISHING

★★ **CheckPost 1.3, Working Software, 408/423-5696, $89.95.** Interface aside, this imagesetter-simulation software is generally disappointing. It can't automatically scale pages, it prints on a single sheet, and its error reporting is limited. **Nov 94**

★★★ **ClickBook 1.1 (1.2), BookMaker Corp., 415/354-8161, $69.95.** If you need to create inexpensive booklets quickly and without hassle, this print utility that helps you format documents in double-sided booklet form is an excellent tool. **Nov 94**

★★★ **Download Mechanic 1.0.2 (1.5), Acquired Knowledge, 619/587-4668, $249.** The strengths of this PostScript downloader lie in its tools for dealing with problem files, but when dealing with large files, it performs slowly and occasionally crashes. **Feb 95**

★★★★ **FontChameleon 1.0.1 (1.5), Ares Software Corp., 415/578-9090, $295.** Font utility introduces a new font-creation technology; it builds serif and sans serif fonts from a master outline file. It offers high-quality renditions of popular fonts, plus the ability to customize fonts. **Sep 94**

★★★ **FontMixer 1.0, Monotype Typography, 312/855-1440, $79.** Although a tad expensive for a one-trick pony, this font utility is a straightforward, relatively painless way to mix characters from different fonts to create composite fonts. **Oct 94**

★★★★ **Fontographer 4.0.4 (4.1), Macromedia, 415/252-2000, $495.** No other font editor does more or works better than this one. For the price of a few font families, it can give you a universe of unique faces. **Oct 94**

★★★★ **LaserCheck 1.0, Systems of Merritt, 334/660-1240, $199.** Imagesetter-simulation software can save you hundreds of dollars, and many hours, on image-setting jobs by letting you use a laser printer to proof your work. **Nov 94**

★★★★ **Let'er RIP 2.0 (2.0.1), Lupin Software, 916/756-7267, $239.** The flexibility, clean implementation, and attention to detail of this PostScript downloader make it a pleasure to use. **Feb 95**

★★★★ **PageTools 1.0, Extensis Corp., 503/274-2020, $129.** Collection of ten PageMaker Additions is packed with utility. Many users will find the PageAlign, PagePrinter, and PageRulers Additions alone worth the price, and the others frosting on the cake. **Dec 94**

★★★ **ReadySetGo 6.0.2, Manhattan Graphics Corp., 914/725-2048, $395.** There's no strong reason not to use this destop publishing software if its tools meet your needs, but there's no compelling reason to choose it, either. Its low price is nice, but not enough. **Oct 94**

★★★★ **theTypeBook 4.0, Rascal Software, 805/255-6823, $59.95.** The manual needs work, but this type-specimen generator provides enough customization options to make it a worthwhile purchase. **Jun 95**

EDUCATION/ENTERTAINMENT

★★★★ **3D Atlas 1.1, EA World, 415/571-7171, $79.95.** Well-designed atlas enriches map data with narration, photos, statistics, and educational QuickTime movies. **May 95**

★★★★★ **A.D.A.M. The Inside Story, A.D.A.M. Software, 404/980-0888, $79.95.** Multimedia anatomy CD-ROM teaches basic anatomy and physiology with a tantalizing mix of sound, graphics, and animation. If you are the least bit interested in learning more about how the human body works, buy this program. **Mar 95**

★★★ **Aquazone 1.0, Inago, 416/487-4005, $59.** The fish in this aquarium simulation are beautiful, but—like many of their real-world counterparts—they're darned hard to keep alive. Only two varieties of fish are included. **Jan 95**

★★★ **Creative Writer 1.0, Microsoft Corp., 206/882-8080, $49.95.** Graphics/page-layout/word-processor hybrid offers some terrific type effects, zany sounds, and bright graphics. While it doesn't teach kids to be better writers, it does encourage them to develop ideas and provides a fun vehicle to express those ideas creatively. **Sep 94**

★★★★ **Crossword Wizard 1.0, Cogix Corp., 415/454-7217, $49.95.** If you're a crossword fan, this crossword-puzzle generator is a must. Although it's not perfect, the play mechanics are fantastic. **Dec 94**

★★★ **The Cruncher, Davidson & Associates, 310/793-0600, $59.95.** If you want to teach a child spreadsheet basics, this combination educational spreadsheet and business application will do the job. It's creative and easy to use, but slow. **Aug 94**

★★★ **CyberBoogie, Times Mirror Multimedia, 314/531-2503, $49.95.** The easy interface, bouncy songs, and cute graphics of this children's animation software make it a good choice for very young kids, but its relative lack of features restricts it to the same group. **Apr 95**

★★★ **Digital Chisel 1.2, Pierian Spring Software, 503/222-2044, $199.95, site license $995.** If I had a Chisel, I'd Chisel out some quizzes; I'd say how easy this is—no I wouldn't. Ahem. What I mean is: this authoring tool lets educators create interactive quizzes, but suffers from a nonstandard interface. **Jun 95**

★★★★ **Grolier Multimedia Encyclopedia, Grolier Electronic Publishing, 203/797-3530, $395.** CD-ROM encyclopedia has excellent search capabilities, weighs much less than a shelf of books, and is lots of fun. Its timeliness and some hierarchical snafus were slight problems. **Jul 94**

★★★ **Kids World, Bit Jugglers, 415/968-3908, $30.** Although the painting tools could be more robust, this screen-saver-creation tool for kids is easy to use, cleverly designed, and can keep kids busy for hours. **Mar 95**

★★★★ **Material World, StarPress Multimedia, 415/274-8383, $59.95.** This multimedia CD-ROM provides a fascinating look at diverse cultures from around the world by documenting the lives of average families. **Jun 95**

★★★ **Small Blue Planet 2.0 (2.0.1), Now What? Software, 415/885-1689, $59.95.** The satellite photos of this atlas are truly dazzling, although the interface is less than world class. **May 95**

★★★★ **Storybook Weaver Deluxe 1.0, MECC, 612/569-1500, $69.95.** Hooray for applications that encourage kids to be creative! This one lets them combine pictures, sounds, and words to make their own storybooks. **May 95**

★★★★ **Theorist 2.0, Waterloo Maple Software, 519/747-2373, $299.** Despite an occasionally odd interface (for example, a hammer icon), this symbolic-math program is a great learning aid for students. **Jun 95**

★★★★ **WarPlanes 1.0, Maris Software, 800/336-0185, $69.** Wonderful multimedia CD-ROM tours the post-WWII era in military aviation. As well as pictures and text, it includes rotatable models of aircraft, an extensive database, campaign maps, historical narration, live combat audio, and three flight simulators. **Mar 95**

★★★★ **Widget Workshop, Maxis Software, 510/254-9700, $44.95.** Fiendishly clever mad scientist's laboratory allows you to build Rube Goldberg-style widgets

out of metronomes, switches, light bulbs, and much more. It encourages imagination and exploration, plus kids think its cool. **Apr 95**

FINANCE/ACCOUNTING

★★ **Financial Competence 1.5, Competence Software, 603/435-5098, $99.** Business economics tutorial explains how financial statements are compiled and how they relate to each other. **Jul 94**

★★★ **MacMoney 4.01 (4.02), Survivor Software, 310/410-9527, $89.95.** Personal-finance software has new and improved features that will please longtime users, but it hasn't kept up with the leaders in the field and won't win many new converts. **Jul 94**

★★★★ **M.Y.O.B. 5.0, BestWare, 201/586-2200, $139; $239 w/payroll.** A well-designed interface makes double-entry accounting easy enough for anyone to do. And—for those small-business owners who are keeping an eye on the bottom line—the price is right. **May 95**

★★★ **QuickBooks 3.0, Intuit, 415/322-0573, $119.** Full-featured double-entry accounting program is easy to use, but its operation is not entirely Mac-like and its cryptic error messages may cause you to ignore serious problems. **Jun 95**

★★★★ **Quicken 5.0, Intuit, 415/322-0573, $49.95.** The addition of a calendar and new ease-of-use features keep this personal finance software comfortably ahead of the pack. This upgrade is an incremental, but still welcome, improvement over an already excellent product. **Feb 95**

★★★ **StreetSmart 1.0, Charles Schwab & Company, 800/334-4455, $59.** If Schwab is where you want your investments held, and if you want to have tighter control over your portfolio and save on brokerage fees, you should seriously consider this financial investment software. **Feb 95**

GRAPHICS

★★★★ **Adobe Dimensions 2.0, Adobe Systems, 415/961-4400, $199.** 3-D effects software has added color support, as well as drawing and text tools. Its ability to create resolution-independent 3-D images and map two-dimensional art earn Dimensions a place on a designer's hard drive. **Apr 95**

★★★★ **Adobe Illustrator 5.5, Adobe Systems, 415/961-4400, $595.** Despite slight speed disappointments, this draw program's upgrade is a bargain. It offers improved text-formatting functions and new trapping capabilities and includes more than 200 tile patterns, 220 fonts, and the Acrobat Distiller and Acrobat Exchange utilities. **Sep 94**

★★★★ **Adobe Photoshop 3.0, Adobe Systems, 415/961-4400, $895.** Image-editing program both broadens its capabilities and simplifies its work environment in this dynamic upgrade. While not perfect, the pros far outweigh the cons. **Jan 95**

★★ **Art Explorer 1.0, Aldus Consumer Division, 206/628-2749, $49.95.** While its cartoon style is refreshing and its features promising, this paint/draw program for kids 8 to 12 years old is still rough around the edges. Its biggest limitation is that it's unusably slow on 68030 Macs. **Feb 95**

★★★★ **Blueprint 5.0, Graphsoft, 410/290-5114, $295.** For plain old 2-D drafting, this CAD software has a rich, easy-to-use feature set and is admirably fast. The Power Mac version in particular is a first choice for large architectural or engineering diagrams. **Jan 95**

★★★ **ClarisDraw 1.0 (1.0v2), Claris Corp., 408/727-8227, $399.** For presentations without grand artistic pretensions, this draw program can be an effective tool. Considering the wobbliness of some of its features, however, $400 may be too much to pay. **Jan 95**

★★★ **Dabbler 1.0, Fractal Design Corp., 408/688-5300, $99.** Art-education and paint software provides an excellent paint set with an appealing if slightly quirky interface, at a great price. **Nov 94**

★★★★ **DeBabelizer Lite 1.0 (1.1), Equilibrium Technologies, 415/332-4343, $129.** Terrific graphics utility converts graphics files from one format to another. It offers a choice selection of capabilities at a nice, slim price. **Aug 94**

★★★★ **ElectricImage Animation System 2.0 (2.1), Electric Image, 818/577-1627, $7495.** Although the price may seem incredibly high, this software, with its extraordinary animation and image-rendering capabilities, is worth every penny for cinematic-production professionals. **Dec 94**

★★★ **Flying Colors Davidson & Associates, 310/793-0600, $59.95.** While not the most dynamic kids' program, this paint/draw program provides easy-to-use tools and nicely drawn stamps for ages eight to adult. **Feb 95**

★★★ **Gryphon Batch It 1.0, Gryphon Software, 619/536-8815, $199.** Arranges tiles in a visual interface to automate repetitive graphics operations. Although it lacks conditional statements, this batch processor is a time-saver. **Jun 95**

★★★★ **IntelliDraw 2.0 (2.0.1), Adobe Systems, 415/961-4400, $99.99.** Wonderful general-purpose graphics package works well, does a great job of automating drawing tasks, and is straightforward. Despite its breadth of features, it always feels approachable. **Sep 94**

★★★ **Koyn Fractal Studio 2.02 (2.1), Koyn Software, 314/878-9125, $119.95.** Software lets you generate beautiful fractals of your own design. It's a reasonable choice if you are interested in Sierpinski triangles or naturalistic forms, but it's not an all-fractals-for-all-people program. **Aug 94**

★★★★ **KPT Bryce 1.0 (1.1), HSC Software, 805/566-6200, $199.** For less than $200, you get a remarkable 3-D landscape-rendering program, a CD-ROM full of images, a slide-show utility, and even some screen-saver modules. Although the innovative, graphics-heavy interface can be confusing, this software is lots of fun. **Dec 94**

★★★ **Live Picture 1.5.5, HSC Software, 805/566-6200, $995.** At its core, this image editor is a promising program rather rudely assembled atop some marvelous technology. Though fast and blessed with all the benefits of a proxy-based system, its day-to-day functions leave plenty of room for improvement. **Dec 94**

★★★★ **LogoMotion 1.0 (1.5), Specular International, 413/253-3100, $149.** Easy-to-use 3-D package is eminently affordable. It's a terrific program, both for creating flying logos and as an entry-level 3-D package for nonprofessionals. **Nov 94**

★★★★ **MacDraft 4.0, Innovative Data Design, 510/680-6818, $449.** Report-links to Excel and a clean interface make this 2-D CAD software an excellent choice for use in mechanical engineering and construction. Plus, it's easy to learn. **Mar 95**

★★★★ **Macromedia FreeHand 5.0, Macromedia, 415/252-2000, $595.** The new version of this venerable program has not only kept pace with the competition but has also added unique features of its own. Although the interface is more cluttered than ever, the wealth of new capabilities make this the drawing program to buy. **May 95**

★★★★ **MetaFlo', The Valis Group, 415/435-5404, $595.** Graphics utility yields interesting visual effects with a minimum of fuss. It imparts elasticity to 2-D images, letting you push and pull collections of pixels while retaining the visual integrity of the image. **Aug 94**

★★★★ **MiniCad 5, Graphsoft, 410/290-5114, $795.** Excellent CAD software for the Power Mac offers major performance for its price. It's admirably easy to learn. **Nov 94**

★★★ **MovieFlo' 1.1, The Valis Group, 415/435-5404, $899.** Tug, twist, and pinch your sister—or at least a digital image of her—with this special-effects program for stills or QuickTime movies. Alas, this well-designed application is hampered by a steep price and a poor manual. **Jun 95**

★★★★★ **Painter 3, Fractal Design Corp., 408/688-8800, $499.** Image-creation program has achieved a rare state of perfection, balancing enhanced conventional controls with spectacular effects packaged inside a tidy interface. It offers a new level of usability and genuine practicality. **Apr 95**

★★★★ **PhotoEnhancer 1.0, PictureWorks, 510/855-2001, $129.** Nifty utility provides dozens of ways to improve the quality of QuickTake photos, from sharpening or softening focus to correcting over- or underexposed shots. Choose an image from a display of enhanced photos to speed the correction process. **Apr 95**

★★★ **PhotoMatic 1.01 (2.0), DayStar Digital, 404/967-2077, $199.** AppleScript-based utility lets you automate tasks in Adobe Photoshop 2.5.1 or later. Although it's limited, it can relieve you of some mundane chores. **Nov 94**

★★★★ **Pixar Typestry 2.1, Pixar, 510/236-4000, $299.** With QuickDraw GX support, an approachable interface, a strong array of animation features, and outstanding image quality, this 3-D type-effects software is worth a try. It adds a new dimension to the way you look at type. **Feb 95**

★★★★ **PixelPaint Pro 3.01, Pixel Resources, 404/449-4947, $379.** Color paint program strikes a good balance between the artistic demands of painting and the technical precision of image processing. New color-management capabilities are a plus for professional users. **Mar 95**

★★★ **PixelPutty Solo, The Valis Group, 415/435-5404, $349.** Affordable modeler lets you manipulate 3-D objects as if they were clay. It's a capable program, but a bare-bones interface and skimpy manual make it somewhat daunting for novices. **Jun 95**

★★★ **Pointillist (2.0), Pictor GraFX, 310/865-0495, $79.95.** Stereogram software creates images that look, at first glance, like random dots, but as you focus beyond the page, a 3-D image emerges from the pattern and appears to hover inches in front of the background. It's gleefully wacky. **Jul 94**

★★★ **Ray Dream Designer 3.1.1, Ray Dream, 415/960-0768, $349.** 3-D graphics program provides competent (if sometimes awkward) modeling tools, offers excellent surface-texturing capabilities, and produces high-quality ray-traced renderings. **Mar 95**

★★★ **ScanPrepPro 1.2 (2.0), ImageXpress, 404/564-9924, $695.** Adobe Photoshop add-on automates the scanning and image-massaging process and produces good results, although the program is somewhat unstable. **Nov 94**

★★★★ **Scenery Animator 1.0.4 (1.1), Natural Graphics, 916/624-1436, $149.** Landscape rendering and animation software uses U.S. Geographical Sur-

continues

Star Ratings

vey data to create remarkably realistic 3-D representations of terrain. Its flaws are few, and our reviewer recommends it. Aug 94

★★★ **Specular Collage 2.0.1, Specular International, 413/253-3100, $399.** Practical image-compositing solution supplies a smooth interface and strong support for Adobe Photoshop 3.0. As long as you're willing to return to Photoshop to confirm your edits and make final changes, it's a serviceable tool. Feb 95

★★★ **Terrazzo 1.0, Xaos Tools, 415/487-7000, $199.** Turning a random group of pixels into a geometric pattern may not be everyone's consuming passion, but this plug-in graphic-effects module has definite appeal for a select niche of fabric, graphic, and video designers. Nov 94

★★★★ **TextureScape 1.5, Specular International, 413/253-3100, $195.** Algorithmic art program lets you manipulate and arrange PostScript shapes to create seamlessly repeating patterns. Like the best tools, it's simple enough to be fun and flexible enough to give you meaningful control. Feb 95

★★★★ **TypeTwister 1.0, Adobe Systems, 415/961-4400, $29.99.** Inexpensive, easy-to-use, and fun type styler lets you create wildly styled text effects, although it won't satisfy hard-core type manipulators. Jan 95

★★★ **Virtus WalkThrough Pro 2.0, Virtus Corp., 919/467-9700, $495.** Aside from occasional stumbles, this design tool is an exceptional program that lets you quickly and intuitively interact with your designs and gives clients the opportunity to visit and explore your creations before they are built. Apr 95

★★★ **Vistapro 3.0, Virtual Reality Laboratories, 805/545-8515, $149.95.** 3-D landscape rendering software uses digital versions of U. S. Geological Survey maps to create images and allows you to add external features such as buildings and rivers. Although it's a good program, it has some limitations. Feb 95

MATH/SCIENCE

★★★★ **Chamber Works 1.0.2 (1.1), OnScreen Science, 617/776-6416, $99.** Simulator for particle-physics events is the best introduction to particle physics yet produced, at a great price. Dec 94

★★★★ **JMP 3.0 (3.1), SAS Institute, 919/677-8000, $695.** This statistics software can be used for a wide range of biological, chemical, and physical-science investigations. New features include floating tool palettes, an annotation tool for data tables, and an experimental-design module. Sep 94

★★★ **Kekulé 1.1, PSI International, 410/821-5980, $495.** Science software reads scanned chemical-structure drawings and interprets them, giving both a diagram for checking interpretation accuracy and a formal string representation of the structure. Nov 94

★★★★ **LabView for Mac 3.0.1 (3.1), National Instruments, 512/338-9119, $1995.** For large-scale, demanding projects in data acquisition and analysis, this scientific software is an unchallenged standard. Jul 94

★★★ **Maple V 3.0, Waterloo Maple Software, 519/747-2373, $795.** If you prefer to do your own programming and function creation, you'll benefit from this symbolic mathematics software's efficient use of your Mac's resources. This version hits most of the points on your symbolic-math wish list. Oct 94

★★★★ **MATLAB 4.1 (4.2c), The Math Works, 508/653-1415, $1695.** Relatively expensive numerical math software has added nearly 100 new graphics commands, improved its treatment of sparse matrices, and added commands for sound processing. Its toolboxes make it a first choice for many applied-science specialties. Nov 94

★★★★ **MLab, Civilized Software, 301/652-4714, $1495.** Mathematical-modeling software lets you do fast computation on numerically complex real-world problems, using an ancient Mac II or higher. You must be willing to write short programs, but professional researchers will find it a rewarding choice. Apr 95

★★★★ **Spyglass Plot 1.0 (1.01), Spyglass, 217/355-6000, $295.** This scientific-charting software is the first choice for serious large-set plot crunching. Oct 94

★★★★ **Statistica/Mac 4.1, StatSoft, 918/583-4149, $695.** At present, this statistical software is the undisputed features-per-dollar champion in the Mac market. Mar 95

★★★★ **SuperScope II 1.25 (1.4), GW Instruments, 617/625-4096, $1490.** Despite a relatively small instrument library, this laboratory data-acquisition software effectively covers a wide range of needs, and learning to use it won't become your life's work. Oct 94

★★★★ **Survival Tools 1.0 (1.1), Abacus Concepts, 510/540-1949, $295.** The combination of survival analysis with the StatView template systems gives you a virtual actuary-in-a-box. It's a great set of tools, conveniently packaged. Feb 95

ORGANIZATION/PRODUCTIVITY

★★★ **ACT 2.0, Symantec Corp., 503/334-6054, $249.95.** Contact manager's file-level compatibility with DOS and Windows and its complete contact management make it worth considering if you can live with its weak scheduling functions. Mar 95

★★★★ **Arrange 2.0, Common Knowledge, 415/325-9900, $349.** If your needs fall beyond the usual calendar and address-book functions, this personal information manager is a strong contender. It now has more calendar functions and print options. Dec 94

★★★ **Claris Organizer 1.0 (1.0v2), Claris Corp., 408/727-8227, $99.** New personal information manager users, lured by the low price, good performance, and ease of use of this product, will find that it meets their needs. Most longtime PIM users won't be tempted to switch. Jan 95

★★ **ClienTrac 2.0, Whiskey Hill Software, 415/851-8702, $99.** It's easy to enter contact information, but this PIM is slim on speed, features, and flexibility. May 95

★★★★ **DateBook & TouchBase Pro Bundle 4.0, Adobe Systems, 415/961-4400, $89.99.** Personal information manager package is now easier to use and offers many new features. The excellent linking between contacts and calendar is the most significant feature. Sep 94

★★★ **DateView 1.0.1 (1.0.2), Prairie Group, Inc., 515/225-3720, $69.95 .** If you're willing to sacrifice some features to get simplicity and speed, this calendar/to-do manager makes sense. It integrates with the contact manager, InTouch. Aug 94

★★★ **Day-to-Day Organizer 1.0, Portfolio Software, 802/434-6400, $149.95.** The address-book and outlining components of this organizer are great, but overall, it's a mixed bag. The calendar interface and the way it handles recurring events need to be improved. May 95

★★★ **Dynodex for Macintosh 3.5 (3.5.2), Portfolio Software, 802/434-6400, $69.95.** Although this program doesn't currently link to a calendar, it is an excellent contact manager. This upgrade has a few new features, improved performance, and an easier-to-use interface. Sep 94

★★★ **Expresso 1.0, Berkeley Systems, 510/540-5535, $69.99.** The just-the-basics approach of this calendar and address book might be just fine for people who don't need the feature set of other calendar programs and enjoy its graphics. Apr 95

★★★ **FastPace Instant Contact 1.0 (1.1), Attain Corp., 617/776-1110, $39.99.** Although this contact manager could use a few additional features—especially a menu-bar search function—it does a capable job, and it is intuitive and easy to use. Jan 95

★★★ **First Things First Proactive 1.1, Visionary Software, 503/246-6200, $149.** Capable scheduling program has some convenient features. It's worth a look if you don't have to share information with a contact manager. Nov 94

★★★★ **In Control 3.0.4 (3.0.7), Attain Corp., 617/776-1110, $85.** Excellent to-do-list manager and outliner, coupled with a good calendar is a strong choice if you live and die by to-do lists. Oct 94

★★★★ **Now Contact and Now Up-to-Date 3.0, Now Software, 503/274-2800, $99.** Taken together, this contact manager and calendar provide a set of solid, reliable tools for keeping your life in order. Users who need to share information over a network may find it close to ideal. Apr 95

★★ **Peanuts Family Organizer 1.0, Individual Software, 510/734-6767, $19.95.** "Hey, Pop, can I borrow the car Saturday night?" "Look at the family PIM and check my calendar, Son." This organizer's endearing interface doesn't make up for missing or poorly implemented features. Jun 95

★★ **Souvenir 2.2, ComposeTel, 415/327-0744, $49.** While this contact manager is fast and simple, it's hard to recommend it when you can buy integrated contact managers and schedulers for about the same price. Dec 94

★★★ **TimeSquare 1.0 (1.0.6), Team Building Technologies, 514/278-3010, $149.** Fast, flexible, network calendar program has lots of handy features, but it's missing a few as well, such as multiday events and label grouping. Aug 94

PRESENTATION TOOLS

★★★★ **Adobe Premiere 4.0 (4.0.1), Adobe Systems, 415/961-4400, $795.** Video-editing software for the Power Mac remains as solid and reliable as previous versions, and also advances far and above its competitors with new and improved professional-level features. With the right hardware, it can give desktop-video editors broadcast-quality products with a minimum of compromises. Dec 94

★★★ **Amazing Animation 1.0, Claris Corp., 408/727-8227, $49.** Cute pictures, funny sounds, and a kid-friendly interface come together in this package that lets children produce short animations or interactive presentations. The canned animations and scenes grow tiresome, however. Jan 95

★★ **Animation Master 2.0.5 (2.09), Hash Inc., 206/750-0042, $699.** Although this animation software packs extraordinary power at a reasonable price, it's difficult to learn and prone to instability. Oct 94

★★★ **Electronic Marker 1.0.2, Consumer Technology Northwest, 503/643-1662, $34.95.** This annotation tool can be a practical enhancement to live demonstrations and on-screen presentations, but it needs better controls for modifying and preserving markup layers. May 95

★★★ **HyperCard 2.2, Apple Computer, 408/**

996-1010, $249. Authoring tool strikes a good balance between power and ease of use, and its price is reasonable. It may not satisfy all your wishes, but it should keep you happily building stacks. Sep 94

★★ **Living Album 2.5, QuickMedia Labs, 408/749-9200, $129.95.** A crowded interface detracts from the usefulness—and aesthetics—of this multimedia album. May 95

★★★★ **Macromedia Director 4.0 (4.04), Macromedia, 415/252-2000, $1195.** Although this multimedia program remains far from easy to use, this admirable upgrade increases the program's power and improves its interface. Multimedia professionals will continue to find it the best package available. Sep 94

★★★ **Microsoft PowerPoint 4.0, Microsoft Corp., 206/882-8080, $339.** If you're in the market for a presentation-graphics program, this is a good choice to use along with Word or Excel, as long as you don't mind the lack of animation functions. For general purposes, though, other alternatives have the edge. Feb 95

★★ **MovieWorks 2.0.2, Interactive Solutions, 415/377-0136, $295.** With diligence you can get decent results with this all-in-one QuickTime-based multimedia package. But other entry-level programs make leaping into multimedia easier and more rewarding. Sep 94

★★ **mPower 2.0, Multimedia Design Corp., 704/523-9493, $295.** Despite a handful of sophisticated multimedia features, this authoring tool is too limited to be compelling. While its push-button interface is easy to understand, it's far too cumbersome. Apr 95

★★★ **The Multimedia Workshop, Davidson & Associates, 310/793-0600, $79.95.** Children or adults can use this media-integration tool without big investments of either time or money. It's full of compromises, though, such as the inability to layer narration over music. Nov 94

★★★★ **Persuasion 3.0, Adobe Systems, 206/622-5500, $495.** Users have plenty of new features to cheer about, including improved tool palettes, extensive charting options, and hypertext functions with this presentation graphics program's upgrade. High memory and disk-space requirements are drawbacks. Sep 94

★★★★ **Presenter Professional 3.0, VIDI, 818/358-3936, $1995.** The improved interface, enhanced animation module, and reduced price of this 3-D modeling and animation package make it an excellent choice for multimedia producers. The new audio features are especially appealing. May 95

★★★ **SoundEdit 16, Macromedia, 415/252-2000, $379.** Digital audio software supports 16-bit sound and has enough goodies to earn it a place in a multimedia producer's toolbox. But its lack of record-level controls limits its usefulness as a professional audio tool. Dec 94

★★ **Special Delivery 2.0, Interactive Media Corp., 415/948-0745, $399.** Multimedia authoring tool can be confusing and isn't the best choice for complex projects. Still, it may save hours of training for users who merely need to create simple presentations. Apr 95

★★★★ **SuperCard 1.7.1 (2.0), Allegiant Technologies, 619/587-0500, $495.** Multimedia authoring system adds a few welcome enhancements and squashes some old bugs. For current users, the upgrade is well worth the price; for others, it's an excellent alternative to more expensive authoring systems. Feb 95

PROGRAMMING

★★★★ **IDL 3.5 (3.6), Research Systems, 303/786-9900, $1500.** In this shockingly powerful, compact, graphics-oriented, interpreted language, a single command is worth a page of C-language code. If you're an image processing professional, you should consider adding IDL to your tool kit. Oct 94

★★ **ScriptWizard 1.0, Full Moon Software, 408/253-7199, $99.** Software attempts to make writing and debugging AppleScript scripts easier but doesn't offer enough improvement over Apple's Script Editor. Jan 95

★★★★ **VIP-C 1.5 (1.5.1), Mainstay, 805/484-9400, $495.** For convenience in producing 680X0/Power Macintosh applications, this programming utility is a fine investment. Intermediate to advanced users will get the most benefit, but even beginners will find that it helps turn student projects into serious apps. Feb 95

UTILITIES

★★ **Apple Personal Diagnostics 1.0 (1.1), Apple Computer, 408/996-1010, $129.** In trying to make a hardware tool for the rest of us, Apple has come up short. This hardware-diagnostics utility has an uneven manual, some less than thorough tests, and a surprisingly unsatisfying interface. Nov 94

★★★★ **Automap Road Atlas for Macintosh 2.01 (2.04), Automap, 206/455-3552, $99.95.** Mapping software tells you how to get where you're going better than any other map or software our reviewer has seen. Although screen redraw is slow, it's worth it for the written directions and maps. Jul 94

★★★★ **Cal 1.0, Thought I Could, 212/673-9724, $79.95.** Well-chosen set of desktop necessities includes an excellent calculator, an associated-formula editor, a datebook, and a calendar. Due to its easy access and ample power, this software has become an everyday tool for our reviewer. Jan 95

★★★ **CanOpener 3.0, Abbott Systems, 914/747-4171, $125.** You can use this handy utility to open many types of files—which can be a lifesaver if you don't have the application a file was created in—but it falls a little short in the file-search department. May 95

★★★★★ **Conflict Catcher II 2.1.1, Casady & Greene, 408/484-9228, $79.95.** Customizable, fast, and safe extension-management utility goes well beyond the basics. For Power Macintosh users, it even tells which extensions aren't written in native code and are likely to slow down Power Macs. Oct 94

★★★★ **Disc-To-Disk, Optical Media International, 408/376-3511, $199.** Audio-capture utility's friendly interface provides a simple way to transfer sound from a CD to the Mac's hard drive. A useful tool for multimedia authors. Jun 95

★★★★ **DiskGuard 1.0.1 and DiskGuard Remote, ASD Software, 909/624-2594, $129 to $799.** Rock-solid, flexible disk-protection tools are worth serious consideration if your Mac or Macs are accessible to other users. The remote version (which comes in five- and ten-user packs) adds network features, including clock synchronization. Mar 95

★★★★ **DiskTop 4.5 (4.5.2), Prairie Group, Inc., 515/225-3720, $69.95.** Organizing a crammed hard drive becomes a more manageable task with this simple but powerful file-management utility that lets you copy, move, rename, delete, and find files—without using the Finder. Jul 94

★★★ **DragStrip 1.0, Natural Intelligence, 617/876-4876, $39.95.** Icon-based file and folder organizer brings a semblance of order to your cluttered desktop. But your troubles aren't over unless a future version lets you label folders. May 95

★★★★ **Drive7 3.0 (3.09), Casa Blanca Works, 415/461-2227, $89.95.** Highly recommended hard drive-formatting utility easily formats and partitions most drives and provides all the options you need. And within its limitations, its Mount Cache utility provides a real performance boost. Nov 94

★★★ **eDisk 2.0, Alysis Software Corp., 415/928-2895, $149.95.** Driver-level software compresses data read to your drive on the fly and automatically expands data read from your drive. It offers transparent compression. Dec 94

★★★★ **Graffiti 1.01, Palm Computing, 415/949-9560, $79.** If you can't seem to teach Newton your handwriting, you can teach yourself a new writing system that Newton can handle. Kind of makes you wonder who's running the show, but it works. May 95

★★★★ **Icon Mania 1.0 (1.02), Dubl-Click Software, 503/317-0355, $69.95.** Delightful icon-editing utility comes with terrific tools for building new icons, including an outstanding thumbnail feature that builds custom icons from graphics files. Aug 94

★★★★ **Kaboom 3.0, Nova Development Corp., 818/591-9600, $49.95.** Sound-effects utility with sound-editing application is a fun program for anyone who wants to play with sound. Feb 95

★★★★ **Launch Pad 1.0, Berkeley Systems, 510/540-5535, $49.99.** If you want to share your Mac with your kids, this desktop utility is a worthwhile investment. It can even speak menu items and file names out loud for kids too young to read. Jan 95

★★★ **MacTools Pro 4.0, Symantec Corp., 503/690-8090, $149.95.** This utility does a good job of diagnosing and fixing disk problems, but suffers from large RAM requirements and expensive technical support. May 95

★★★★ **Maxima 3.0, Connectix, 415/571-5100, $99.** If you have more than 8MB of RAM, you can use some of it as a RAM disk, speeding up disk-based operations, with this inexpensive utility. Nov 94

★★★★ **MultiClip Pro 3.1, Olduvai Corp., 305/670-1112, $59.** Easy-to-use utility is exactly what Apple's Clipboard and Scrapbook should have been; a convenient repository of data that moves between documents without fuss or muss. Apr 95

★★★★ **Norton DiskDoublerPro 1.1, Symantec Corp., 503/334-6054, $109.** Utility collection includes DiskDoubler, AutoDoubler, and CopyDoubler. Because of its ease of use, the product is a good choice for beginners. Feb 95

★★★ **Norton Utilities for Macintosh 3.1, Symantec Corp., 503/334-6054, $149.95.** Data-protection and -recovery utility collection is leaner, meaner, and faster than ever before, but it's also surprisingly uneven. While Disk Doctor leads the pack for disk-repair utilities, the back-up module is weak and the new UnErase module is missing some features. Feb 95

★★★★ **Now Utilities 5.0, Now Software, 503/274-2800, $89.** Three of the modules of this fine-tuned, interlocking utility set—Now FolderMenus, Now Menus, and Now SuperBoomerang—are almost indispensable, and while the other six may not be tops in their category, they're well worth considering. As a collection, this package remains the best in the business, and it's Power Mac native. Jan 95

★★★ **PaperPower 1.0, Piptel, 513/294-6656, $149.** Graphics-tablet utility provides a useful tool for creating and using macros, but the overlays it creates can be tricky to use. Apr 95

continues

Star Ratings

★★★ **Peirce Print Tools 1.0, Peirce Software, 408/244-6554, $129.** Nine handy printing utilities work with QuickDraw GX. Most of the modules are useful, but not all are must-haves. Jan 95

★★★ **PopupFolder 1.0 (1.5.1), Inline Software, 617/935-1515, $59.95.** Finder utility is so handy and easy to use, you wonder why it isn't built into the Mac's system software. On the other hand, it's sluggish when readying pop-up menus for every folder. Aug 94

★★★★ **PowerAgent 1.1 (2.0), SouthBeach Software Corp., 305/942-0605, $159.** You can revolutionize your Macintosh work with this agent program that manages scripts. It provides excellent support for FileMaker Pro. Nov 94

★★★★ **PowerMerge 2.0, Leader Technologies, 714/757-1787, $129.** Powerful file-management tool helps you keep individual files, folders, or entire volumes organized and up-to-date. This version lets you compare and launch documents, rename files, trash superfluous files, and lots more. Aug 94

★★★ **ProFiles 1.0, Dayna Communications, 801/269-7200, $129.** Unusual new utility lets you group related files and folders for quick access and actions such as making aliases, copying, and more. Aug 94

★★★ **RescueTxt 1.0, Abbott Systems, 914/747-3116, $79.** If you want decent performance and the ability to locate text in even a deleted file, this text-retrieval utility is a good choice. It doesn't tell you what file the text comes from, however, so you cannot simply open the found file. Apr 95

★★ **SCSI Director Pro 3.0.6 (3.1.1), Transoft Corp., 805/565-5200, $99.** Utility provides simple, one-button hard disk formatting, but when it comes to doing some of the fancy tricks, the going gets rough and technical support costs $1.90 per minute. Sep 94

★★★★ **Square One 2.0 (2.0.1), Binary Software, 310/449-1481, $74.** The slick design, flexibility, and straightforward interface of this file-launching utility make it a pleasure to use. Dec 94

★★★ **Stop & Go 4.0, Engram International, 415/455-1100, $69.99.** File-protection/relaunch utility uses a portion of your hard disk to save a snapshot of the data in your Mac's RAM. It's fast, and it relaunches files, applications, and extensions in a single, unified process, but it's unduly complicated. Oct 94

★★★★ **TypeTamer 1.0.4, Impossible Software, 714/470-4800, $59.95.** Versatile font utility provides information on installed fonts and simplifies tasks such as typing special characters and reselecting fonts from the menu. May 95

★★★★ **Virex 5.5.1, Datawatch Corporation, 508/988-9700, $99.95.** Comprehensive, reliable, and speedy utility helps protect your files from those misguided lads who get their jollies by releasing viruses. To keep it current, updates are available on online services. May 95

★★★★ **VirtualDisk 1.1a (2.02), Continuum Software, 503/848-7112, $79.** Rapid disk cataloging; fast, efficient label-printing; and an excellent disk-copy utility make this software a wonderful value. Jul 94

VERTICAL MARKETS

★★★ **Autoscore 1.0, Wildcat Canyon Software, 510/527-5155, $150.** Converting the human voice into MIDI note information is a challenging task. If you have the right music software, mike, and voice, this music-recognition software can actually pull it off. Feb 95

★★★ **Bird Brain 2.01, Ideaform, 515/472-7256, $99.95.** Database lets bird watchers record every sighting of every bird they have ever seen to create electronic life lists. Although it can be slow, it includes species names and other information. Jan 95

★★★ **ConcertWare 1.5.7, Jump Software, 415/917-7460, $159.** Although it lags behind the competition in performance and features, this music-notation program's low price and ease of use make it a viable choice for the budget-wise. Jun 95

★★★ **DigiTrax 1.1, Alaska Software, 408/738-3320, $349.** If you're an amateur musician or a multimedia producer with modest sound-recording needs and you have a Quadra AV, consider this audio-recording software. What it lacks in features, it makes up for in simplicity and a relatively low price tag. Mar 95

★★★ **ErgoKnowledge 1.0, Visionary Software, 503/246-6200, $395.** Despite a few shortcomings, this CD-ROM offers a good, basic review of office-computer ergonomics. Dec 94

★★★ **MayaCalc 2.3.1 (2.3.3), Ecological Linguistics, 202/546-5862, $120.** 4th Dimension database alleviates much of the pain involved in working with the complex, multilayered Maya calendar. Although the design could be improved, it's a highly useful tool for both serious and casual Maya enthusiasts. Feb 95

★★★★ **Maya Hieroglyphic Fonts, Ecological Linguistics, 202/546-5862, $10 to $60 per set.** Although these fonts based on Mesoamerican hieroglyphic scripts are beautifully rendered, the character spacing is sometimes uneven. Feb 95

★★★★ **Mayo Clinic Family Health Book, IVI Publishing, 612/996-6000, $69.95.** Medical CD-ROM for home use deals with the full gamut of health-care topics, from AIDS to zygotes, although it doesn't include any reference to alternative therapies. Sep 94

★★★ **Mayo Clinic: The Total Heart 1.0, IVI Publishing, 612/686-0779, $21.75.** Cardiovascular health and related subjects are the topics of this medical CD-ROM for home use. Although it makes liberal use of drawings, photographs, and animations, video sequences would have been more effective. Sep 94

★★★ **Medical HouseCall 1.0, Applied Medical Informatics, 801/464-6200, $99.95.** Interactive medical guide is a painless way for people to learn about diseases, tests, and therapies. Although it's easy to use and interesting, some images were incorrectly labeled. Feb 95

★★★ **MusicTime 2.0 (2.0.1), Passport Designs, 415/726-0280, $149.** Music-notation program is geared for hobbyists and students. If your needs aren't complex, it may fit the bill, at a great price. Oct 94

★★★★ **Overture 1.02, Opcode Systems, 415/856-3333, $495.** Easy-to-learn, midrange notation software has a friendly interface and shows real polish. If you don't need all the features of a high-end product, it's a serious contender. Apr 95

★★★ **Performer 5.02, Mark of the Unicorn, 617/576-2760, $495.** A colorful, redesigned interface and improved sheet-music view are just part of this MIDI recording program's worthwhile overhaul. If you like the sheet-music view, this is the product to buy. Mar 95

★★★★ **Practica Musica 3.0 (3.1), Ars Nova Software, 206/889-0927, $140.** Music-teaching program, with emphasis on sight-reading and ear-training techniques, shines as a smart, infinitely patient personal music coach in the classroom. Jan 95

★★★ **Route 66 1.5, Route 66 Geographic Information Systems B.V., 415/957-0666, $79.95.** Jack Kerouac could have saved a lot of time if he'd used this route planner (unless he was planning to drive to Alaska, which isn't included). It's fast, but omits some cities and can't handle more than three destinations at a time. May 95

★★★ **SAM-CD, Scientific American Medicine, 212/754-0550, $395.** Despite a few shortcomings, such as the poor interface for case simulations, this medical reference work—a popular series of publications covering topics in clinical medicine—should prove a worthwhile addition to any medical library. Sep 94

★★★ **Vision 2.08, Opcode Systems, 415/856-3333, $495.** MIDI program's list of exclusive, creativity-slanted features, such as endless count off and scrubbing (which lets you hear the music as you drag across it), give the program a usability edge. Mar 95

WRITING TOOLS

★★★★ **Bookends Pro 3.1, Westing Software, 415/435-9343, $129.** Comprehensive database program catalogs and stores all of your reference material—actual quotes as well as citations. It's a useful tool that researchers will appreciate. Mar 95

★★★★ **EndNote Plus 2.0, Niles & Associates, 510/649-8176, $299.** Despite its power, this indispensable bibliography and citation manager is surprisingly easy to learn and use. If you have to work with references, it's a good choice. Apr 95

★★★ **FullWrite 2.01, Akimbo Systems, 617/776-5500, $395.** As the leanest of all high-end word processors, this product requires only 2MB of RAM. Although its modular architecture is complex, it's worth considering if you don't need to share files with the Word/WordPerfect crew. Apr 95

★★★ **Grammatik 6 for Macintosh, Novell, 801/225-5000, $49.95.** The low price, pleasant interface, and improved accuracy of this grammar checker make it worthwhile for a large number of quality-driven writers. It still misses some errors. Feb 95

★★★ **Inspiration 4.1, Inspiration Software, 503/245-9011, $195.** Writing tool allows you to move between words and diagrams to show the relationships between ideas. This version adds improved keyboard controls, import and export capability, plus more. Apr 95

★★★ **Microsoft Word 6.0, Microsoft Corp., 206/882-8080, $339.** If you can put this word processor's new features—including cross-referencing, AutoText, automatic numbering, macros and more—to work and you have a Quadra 650 or faster Mac, take the plunge. If you have a slower 68040 Mac, think twice; and if you have a 68030 Mac, don't even think about it. Feb 95

★★★ **Nisus Writer 4.0, Nisus Software, 619/481-1477, $495.** In a few specialized areas—such as mixing English and non-Romance languages, this word processing program is unmatched. However, for some high-end uses, such as table creation, it's a poor choice. Mar 95

★★ **Read-It O.C.R. Pro 5.0, Olduvai Corp., 305/670-1112, $395.** Although this OCR software has a nice collection of features, its recognition engine isn't up to par. It's not a first choice unless you simply need to process piles of very clear Courier text. Apr 95

★★★ **TextBridge 2.0, Xerox Imaging Systems, 508/977-2000, $99.** Optical character recognition software is impressive on good documents and can be trained and automated. You won't find that anywhere else at this price. Sep 94

★★★ **Writing Coach 1.0, WritePlace Software, 503/484-6380, $89.** If you'd like help with your writing, this writing-skills tutorial could be a great investment. Skillfully worded worksheets assist with planning, organizing, and revising. Dec 94

Hardware

INPUT DEVICES

★★★★ **ArtPad, Wacom Technology, 206/750-8882, $199.** Measuring less than 7 by 7½ inches, this pressure-sensitive tablet is sheer convenience if you're looking for a device that you can hide away one moment and readily exhume the next. Apr 95

★★★★ **DrawingSlate II, CalComp, 602/948-6540, $395.** A responsive stylus and user-definable macros make this digitizing tablet an excellent choice for artists and illustrators. Jun 95

★★★ **Ear Phone Streamline AV, Jabra Corp., 619/622-0764, $169.** As a hands-free telephony tool—and as a replacement for the Apple PlainTalk microphone—this telephone/speech-recognition earpiece is a winner. Its biggest drawback is that you can't hear other Mac sounds when it's plugged in. Jul 94

★★★★ **FlightStick Pro for Macintosh, CH Products, 619/598-2518, $129.95.** The authentic look and feel of this joystick, along with well-conceived software, make it a nearly perfect desktop pilot's companion. Dec 94

★★★★ **Mac Keyboard Deluxe, MicroSpeed, 510/490-1403, $125.** If you're in the market for a new or replacement keyboard, this one, which is both smaller and lighter than Apple's Extended Keyboard, is worth considering. It has four ADB ports. Nov 94

★★★ **Mouse Deluxe Mac, MicroSpeed, 510/490-1403, $69.** The extra buttons of this mouse offer several features that Apple's mouse doesn't match, but its shape may not suit everyone's taste. Mar 95

★★★★★ **PaperPort, Visioneer, 415/812-6400, $399.** The paperless office is actually here. This clever combination of elegant hardware and intelligent software makes it easy to capture, organize, and retrieve documents. Once a page is scanned in, you can annotate it; run it through OCR software; or print, fax, or E-mail it. May 95

★★★ **QuePoint, MicroQue, 801/263-1883, $149.** Tired of shoving a mouse around? Slide your finger across this tiny input device to manipulate the cursor with a minimum of movement. May 95

★★★ **Remote Point, InterLink Electronics, 805/484-1331, $199.** Although it may not be a first choice for desktop work, this infrared pointing device is an elegant workaround for users who don't want to (or can't) be tethered to their Macs. Apr 95

★★★★ **Thinking Mouse Macintosh ADB, Kensington Microware, 415/572-2700, $139.95.** A mouse is a mouse is a mouse. Not so. This one has four programmable buttons that you can use—with the accompanying software—to automate such tasks as selecting commands or typing text. May 95

MISCELLANEOUS HARDWARE

★★★★ **AirNote 1.0 (1.1), Notable Technologies, 510/208-4400, $299.** Remote-messaging service lets you originate alphanumeric paging messages from your own computer, eliminating both dictation charges and errors in translation. It's a very handy way to get into alphanumeric paging. Dec 94

★★★ **Apple PCMCIA Expansion Module, Apple Computer, 408/996-1010, $219.** Well-integrated, well-designed unit offers 500-series users an efficient and easy albeit expensive way to add features to their PowerBooks. If you can overlook the early-adopter prices (a big if), the PC Cards are great expansion options—lightweight, low-power, and high-performance. Mar 95

★★★★ **Colortron, Light Source Computer Images, 415/925-4200, $1195.** Getting the colors on your screen to match those in your printed output is now easy and affordable, thanks to this hand-held spectrophotometer, which measures both transmissive and reflective sources. Jun 95

★ **EAB401P Speakers, Panasonic Communications & Systems, 800/742-8086, $99.** Small, inexpensive speakers provide less-than-state-of-the-art performance. The audio is thin and reedy. Apr 95

★★ **EAB701P Speakers, Panasonic Communications & Systems, 800/742-8086, $249.** The sound of these speakers is thin and slightly harsh, although they are attractive in a high-tech sort of way. Apr 95

★★★★ **IX-4015 Color Image Scanner, Canon Computer Systems, 714/438-3000, $1169.** The price of this color flatbed scanner is competitive, and its speed and excellent bundled software make it easy to use and a good choice for the small office. Jul 94

★★★★ **MMS557, Audio-Technica USA, 216/686-2600, $149.95.** Among a huge selection of similarly priced speaker systems, these stand out as a best buy. They look good, as well as sound good. Apr 95

★★★★ **MultiSpin 4Xe, NEC Technologies, 708/860-9500, $515.** With its competitive price, free tech support, and two-year warranty, this quad-speed CD-ROM player is ready to race. Feb 95

★★ **NEC AudioTower, NEC Technologies, 800/632-4636, $99.** Looks great; sounds mediocre. Although this speaker system provides a convenient jack for an external CD drive, the sound quality is nothing to shout about. May 95

★★★★ **Photo Engine, Radius, 408/541-6100, $1099.** Photoshop acceleration hardware's suite of four 66MHz 32-bit DSP chips offers sufficient processing power to speed up 25 Photoshop functions on the most sophisticated systems, including Power Macs. Feb 95

★★★★ **Reno Portable CD-ROM Player, MediaVision, 510/770-8600, $349.** Have CD-ROM, will travel. This portable player is lightweight, versatile, and easy to set up; about the only complaint is its short battery life. Jun 95

★★★★ **SCSI Sentry, APS Technologies, 816/483-6100, $79.95.** Although the price of this terminator may seem steep, this device may well be the cure for SCSI woes. Our reviewer heartily recommends it. Sep 94

★★★★ **TurboDialer, Micromachines, 818/901-1700, $69.95.** Automatic telephone dialer is a well-executed product, except for occasional computer noise that seeps into phone conversations. Jul 94

★★★★ **Vivace, Coda Music Technology, 612/937-9611, $2295.** As an intelligent and endlessly patient accompanist, this music study system for wind instruments may be the best thing that's happened to learning wind literature since the metronome. Jan 95

MODEMS/NETWORK HARDWARE

★★ **Cooperative Adapter, Photonics Corp., 408/955-7930, $449.** The high cost of each unit, the limitations and restrictions inherent in diffuse infrared, and the extremely low cost of traditional LocalTalk adapters and cabling make this infrared network interface an expensive niche product. Dec 94

★★★ **DaynaPort Pocket SCSI/Link, Dayna Communications, 801/269-7200, $299 to $369.** Inexpensive, lightweight SCSI-to-Ethernet connector works with both desktop Macs and PowerBooks and can use the Mac's ADB port as a power source. Nov 94

★★★ **FastSwitch 10, Grand Junction Networks, 510/252-0726, $6250.** Switched Ethernet hub is a great solution for networks that handle large amounts of data traded peer-to-peer, but if your network consists of E-mail and a file server, you probably won't see much benefit in stepping up to switched Ethernet. Dec 94

★★★ **OneWorld Fax, Global Village Communication, 408/523-1000, $999.** Easy-to-use network fax product lets an office share fax-sending resources without dedicating a hard drive and CPU. Aug 94

★★★★ **OneWorld Internet 1.0, 700 Series, Global Village Communication, 408/523-1000, $1699 plus monthly fee.** Users of an office network can connect to the Mother of All Networks with this Internet gateway. It offers E-mail and direct Internet access in an approachable format. Jun 95

★★★ **Pocket EtherTalk Adapter, Xircom, 805/376-9300, $349 to 399.** All-in-one SCSI-to-Ethernet connector is lightweight and works with desktop Macs and PowerBooks. Nov 94

★★★★ **PowerPort Mercury/PB 500 Series, Global Village Communication, 408/523-1000, $399.** Top-notch internal fax modem for 500-series PowerBooks is capable of exemplary fax and data communications performance. Nov 94

★★★ **Spectra-Com P192mx, Bay Connection, 408/270-8070, $169.** If you must have absolute portability and AC power isn't available, this pocket data/fax modem can do the job. It's not that much smaller than a regular desktop modem, however. Oct 94

★★★★ **SupraFaxModem 288, Supra Corp., 503/967-2410, $274.95.** This 28,800-bps fax modem is a very good performer, and the price of admission isn't steep. Combined with fast, stable fax software and a good terminal program, it's hard to beat. Aug 94

★★★ **Watermark Message Central 2.0.2 (3.0), High Tide Software, 510/704-9927, $499.** If you're willing to put in a lot of effort, you'll find this highly sophisticated voice-mail system supremely flexible. It includes a specially modified modem with voice chip, as well as fax software and telecommunications software. Jul 94

PRINTERS

★★★★ **Apple Color StyleWriter 2400, Apple Computer, 408/996-1010, $525.** Economical, QuickDraw-based color ink-jet printer offers gorgeous color output plus fast black-and-white printing. If you don't need DOS/Windows compatibility, it's a good buy. Apr 95

★★★★ **LaserWriter 16/600 PS, Apple Computer, 408/996-1010, $2399.** If speed is what you need, this fine printer is it. The price is reasonable. Mar 95

★★★ **P-Touch PC, Brother International Corp., 908/356-8880, ext. 4307, $449.95.** Versatile label printer is easy to set up and use, and produces high-quality output. The cost per label is high, though, and the documentation is weak. Sep 94

★★★ **Phaser 140, Tektronix, 503/627-7111, $1695.** If you're looking for a capable color printer for a small workgroup, this ink-jet is a great choice. It provides only 17 resident fonts, however. Apr 95

★★★★ **PowerPrint 2.5 (2.5.2), GDT Softworks, 604/291-9121, $149.** Ingenious hardware-software combo lets the Mac print to almost any PC printer. It supports over 1000 printers—from aging dot matrix models to the newer color ink-jet and laser printers. Sep 94

continues

Star Ratings

★★★ **PrimeraPro, Fargo Electronics, 612/941-9470, $1895.** The photo-realistic output of this thermal-wax and dye-sublimation printer beats that of any other printer in the price range. But with expensive consumables and slow print time, it's best suited for routine thermal-wax use and occasional dye-sub work. Jan 95

★★ **QMS ColorScript Laser 1000, QMS, 205/633-4300, $6999.** Color laser printer succeeds in combining the versatility of monochrome laser printing with attention-getting color, but if you don't need to chase rainbows right away, you might wait and see if competition drives capabilities up. Jul 94

★★★★ **Stylus Color, Epson America, 310/782-0770, $699.** This color ink-jet printer is no speed demon at 720-dpi resolution, you need special paper for hi-res output, and it offers no color correction. But who cares? The print quality is superb and the price is reasonable. May 95

SCANNERS

★★ **Pro Imager 4000, PixelCraft, 510/562-2480, $2995.** This midrange scanner delivers excellent highlight detail but produces a lot of noise in shadow areas. It doesn't measure up to similarly priced competitors in speed or image quality. Jun 95

★★★★ **Pro Imager 8000, PixelCraft, 510/562-2480, $12,995.** Demanding prepress users will like this scanner's tonal sensitivity, high resolution, large image area, and impressive speed. Although its color-adjustment software needs work, this is a superb scanner. Jun 95

★★★ **Reli 4830T, Relisys, 408/945-9000, $1699.** The good: high-quality scans, midrange price; lots of bundled software. The bad: slow performance, quirky scanning software. The upshot: If you can live with the cons, this scanner is a bargain. Jun 95

★★★★ **SprintScan 35, Polaroid, 617/386-2000, $2495.** Compact, efficient scanner offers a cost-effective way to transfer images from 35mm slides or negatives to a Mac. Jun 95

SYSTEMS/STORAGE

★★★★ **Alacrity PM 6100, KS Labs, 614/374-5665, $165.** Installing a clock booster is the quickest, easiest, and cheapest way to extract more power from Apple's entry-level Power Mac. Oct 94

★★★★ **Brainstorm Accelerator for the Macintosh SE, Brainstorm Products, 415/988-2900, $199.** Your SE will never be a Power Mac or even a IIsi, but if your budget won't buy a new Mac, you can't do better than this accelerator, which pushes an SE's speed to close to a Classic II's in overall performance. Mar 95

★★★ **Conley SR2 RAID System, Conley Corp., 212/682-0162, $21995.** While RAID technology is typically praised for its fault-tolerance rather than its speed, this high-performance storage system proves that you can have both. For critical tasks requiring redundancy and round-the-clock operation, this is one of the best systems shipping. Sep 94

★★★ **Joule System, La Cie, 503/520-9000, Price varies by component.** Plug-and-play tower lets you stack drives—including hard drives, removable media, and other modules—atop a base unit, making it easy to buy extra storage or swap modules with other Joule towers. Joule drive prices are generally slightly higher than for comparable drives, however. Feb 95

★★★ **Newton MessagePad 110, Apple Computer, 408/996-1010, $599.** This is the personal digital assistant that Apple should have shipped in August 1993, with improved handwriting recognition, including deferred and letter-by-letter recognition. It also has more memory, longer battery life, and a more efficient design. Aug 94

★★★★ **OrangePC Model 200 Series, Orange Micro, 714/779-2772, $1139 to $3237.** If your goal is to get a Mac that runs Windows as fast as a PC, you can't get there from here. If your goal is to get business-level performance for day-in, day-out use, these PC coprocessor cards are your best choice. Aug 94

★★★★ **PLI Infinity 270 Turbo, PLI, 510/657-2211, $599.** This 270MB SyQuest drive is fast, reliable, and a very good product. The cost of the medium is competitive with that of optical drives. Sep 94

★★ **PowerBook 150, Apple Computer, 408/996-1010, $1449.** Fast, lightweight portable is minimalist in the extreme, with no video-out, ADB, Ethernet, or microphone. Unfortunately, the price is less minimalist, and most budget-conscious shoppers would be better off buying a used or discontinued model. Dec 94

★★★ **PowerBook 540c, Apple Computer, 408/996-1010, $4839.** The prestige PowerBook du jour, this sleek, curvy and futuristic-looking notebook makes a good computer for both on-the-road and in-the-office use. Its nonstandard battery, memory, and Ethernet ports are not ideal features, however. Oct 94

★★★★ **PowerBook Duo 280c, Apple Computer, 408/996-1010, $3759.** If you travel a lot, this notebook computer is hands down the best Mac to get. It offers close to the power of a Quadra 650 in a subnotebook. Oct 94

★★ **PowerBook Duo Dock II, Apple Computer, 408/996-1010, $969.** Apple has added Ethernet to this full-featured docking station, but installing NuBus cards is still absurdly difficult. Oct 94

★★★★★ **Power Macintosh 7100/66, Apple Computer, 408/996-1010, $2899.** Midrange Power Mac makes an outstanding workstation whose power should last for several years. The price is nothing to take lightly, but this system delivers every dollar's worth. Aug 94

★★★ **Power Macintosh 8100/110, Apple Computer, 408/996-1010, $6379.** High-end users who have invested heavily in NuBus cards can protect their investment with this top-of-the-line Power Mac. Mar 95

★★★★ **Power Macintosh 8100/80, Apple Computer, 408/996-1010, $4249.** While this system doesn't quite offer the excellent price/performance ratio of the other available Power Macs, you should consider it if you're a high-end user moving your work over to RISC-based computing. Aug 94

★★★ **Power Macintosh Upgrade Card, Apple Computer, 408/996-1010, $699.** Current 33MHz 040 machines will get the best bang for the buck with this card, which is a less expensive upgrade path than a standard motherboard replacement. However, other Macs won't realize as much of a performance gain. Oct 94

★★★★ **Quadra 630, Apple Computer, 408/996-1010, $1279.** Fast, inexpensive, expandable 33MHZ 68040 machine may be the last 680X0-based desktop Macintosh, but it's one of the best entry-level Macs ever. Nov 94

★★ **RCD-1000, Pinnacle Micro, 714/727-3300, $1995.** The software for this CD-Recordable drive is easy to use, but it's too unreliable to use as a day-to-day backup system. Jun 95

VIDEO/DISPLAY

★★★ **Apple Macintosh Display Card 24AC, Apple Computer, 408/996-1010, $1579.** 24-bit accelerated graphics card offers a satisfactory price/performance ratio, although it can't switch resolutions from the keyboard. Oct 94

★★★★ **Apple Multiple Scan 15 Display, Apple Computer, 408/996-1010, $509.** The tridot tube of this 15-inch monitor provides a sharp and accurate image, but reflects some glare. The built-in stereo speakers reproduce sound nicely. Feb 95

★★★ **Apple QuickTake 100 for Macintosh, Apple Computer, 408/996-1010, $749.** For a medium-quality, digital color camera, this is the best deal around. But you may want to wait until some of the camera's problems, such as its fixed-focus lens, are ironed out. Jul 94

★★★★ **FlexCam, VideoLabs, 612/988-0055, $595.** Small, unobtrusive desktop video camera has a flexible gooseneck for positioning. Use it for video capture or videoconferencing. Dec 94

★★★ **L-TV Portable, Focus Enhancements, 617/938-8088, $229.99.** Sturdy, inexpensive, external TV-converter plugs into your Mac and converts video output to NTSC. Aug 94

★★★ **L-TV Pro NuBus, Focus Enhancements, 617/938-8088, $299.99.** NuBus card converts your Mac's RGB video signal to NTSC so you can use your Mac with a TV or VCR. It supports a wide range of Macs, but the image has some flicker and distortion. Aug 94

★★★★ **Multiscan 15sf, Sony Computer Peripheral Products, 408/432-0190, $569.95.** Trinitron monitor has a flat screen that displays sharp, bright, and accurate images. With good antiglare coating and adjustable image tilt, it's worth looking at. Feb 95

★★★★ **MultiSync 3V Monitor, NEC Technologies, 708/860-9500, $495.** With a bright display and great image quality, this monitor delivers a fine picture at a moderate price. Feb 95

★★★★ **Panelight ZX, Panelight Display Systems, 415/772-5800, $3995 to $4695.** LCD panel offers vivid images at a comparatively low price. It's a great choice for presenters. Mar 95

★★★ **The Presenter Plus Mac/PC, Consumer Technology Northwest, 503/643-1662, $429.** Small, external TV-converter supports output to television from most Macs with built-in video. Aug 94

★★★ **QA-350 LCD, Sharp Electronics Corp., 800/237-4277, $1995.** At less than half the cost of a typical active matrix LCD panel, this passive matrix projection panel offers an economical alternative. Jul 94

★★★ **QA-1500, Sharp Electronics Corporation, 201/529-8731, $5795.** While this LCD panel's display is crisp and flicker-free, placing a presentation on its PC Card is cumbersome. Less expensive products are available. May 95

★★★★ **QuickCam, Connectix Corp., 415/571-5100, $149.95.** For as little as $99 (street price), this tiny, fun, easy-to-use, digital video camera lets users experiment with video input for making QuickTime movies or capturing still images. Mar 95

★★★★ **SpigotPower AV, Radius, 408/541-6100, $999.** Make full-screen, 30-fps movies with this first-rate video-compression-and-decompression board and accompanying JPEG software. Jun 95

★★ **Tornado Graphics Card, Mirror Technologies, 612/832-5622, $699.** Inexpensive 24-bit accelerated graphics card has zoom and pan options but is relatively slow. Oct 94

★★★ **VideoDirector, 1.5, Gold Disk, 408/782-0200, $199.95.** Low-end video-editing system lets you log, edit, and organize videotape footage, copying selections from a source deck to a record deck. A good choice for nonprofessionals. Jun 95

Streetwise Shopper

SPECIAL HARDWARE AND SOFTWARE BUYING OPPORTUNITIES

Selected and edited by Charles Barrett

The following listings include both time-sensitive promotions and open-ended offers being sponsored by Macintosh vendors and their resellers. Each listing indicates which products have been awarded a star rating in *Macworld's Reviews* (products rated ★★ or lower are not eligible for inclusion), have been selected as an **Editors' Choice**, or have won a **World-Class** award. In some cases, the editorial evaluation quoted is for an earlier product version. The ◐ symbol indicates that the product is Power Mac related. Except where otherwise indicated, prices given are suggested retail prices.

When placing an order, please mention that you saw the offer in *Macworld*. Should any problems arise, contact the *Streetwise Shopper* editor by fax (415/442-0766), phone (415/978-3241), or mail (*Macworld*, 501 Second St., San Francisco, CA 94107).

Vendors and resellers desiring to have products and services included in this section are encouraged to contact the *Streetwise Shopper* editor with particulars.

BUNDLES

◐ **AddDepth 2 + Typefaces + Clip Art** Ray Dream is including 30 display typefaces from FontBank and 200 clip-art images from Ultimate Symbol's Design Elements collection with its $99 (reduced from $149) 3-D–effects software (Aug 93 ★★★ for AddDepth 1.0.2). Current customers can upgrade to AddDepth 2 for $39 until 8/31/95. Call 800/846-0111 for more information.

Anubis Professional + CD AutoCache CharisMac Engineering is offering a $99.95 bundle consisting of its $129.95 Anubis Professional SCSI-device formatter and driver utility and its $79.95 CD AutoCache, which monitors how CD-ROM disc data is being used and automatically adjusts cache and page sizes accordingly. Call 800/487-4420 for more information and to order.

◐ **ClarisDraw + ◐ ClarisImpact 1.0** A bundle consisting of Claris's $399 draw program for free-form graphics (including over 2400 pieces of clip art) and its $149 integrated charting and diagramming program (Jun 94 ★★★★) is available for $199 through corporate resellers and retail outlets, or directly from Claris. Current customers who purchased ClarisDraw prior to April 1995 can obtain ClarisImpact direct from Claris for $49 (S&H charge only for purchases made after April 1). Call 800/325-2747 for more information. *Offer expires 7/31/95.*

DrawingSlate II + ◐ Painter 3 CalComp is including Fractal Design's $499 Painter image-creation program (Apr 95 ★★★★★) with the 6-by-9-inch (active area) $395 version of its DrawingSlate II digitizing tablet (Jun 95 ★★★★), which includes a cordless pressure-sensitive pen. Available from resellers, such as MacMall (800/222-2808) for $490 (#68782). For additional resellers, call 800/932-1212.

FlexScan Monitor + ScreenManager Pro + Universal Adapter + After Dark 3.0 Nanao USA is bundling its ScreenManager Pro display utility (with serial cable) for point-and-click control of monitor functions, and a universal Macintosh adapter, free of charge with any of seven FlexScan monitor models, which include Sonnentec's Colorific software for calibrating color with printers. A coupon good for one free (except $5 S&H) copy of Berkeley Systems' $49.99 After Dark screen saver is also included. Call 800/800-5202 for more information.

JVC RomMaker + ◐ Director 4.0 + ◐ MacroModel 1.5 Marcan, a CD-ROM reseller, is offering Macromedia's $1195 multimedia and animation program (Sep 94 ★★★★, 1994 World-Class) and $895 three-dimensional modeler (May 94 ★★★★) free of charge to customers who purchase either the $5495 double-speed or $7495 quad-speed JVC RomMaker—a CD-ROM recording system intended for text and graphics archiving, 16-bit audio, and multimedia applications. Buyers can substitute 30 blank CDs for the two multimedia authoring tools. Call 800/635-7477 for more information.

◐ **Power 80, 100, or 110 + Quicken 5 + ◐ ClarisWorks 3.0 + ◐ Now Utilities 5.0 + Now Contact 3.0 + Now Up-to-Date 3.0 + Bitstream Fonts** Power Computing is including the following software free of charge with its Mac-clone desktop systems, priced from $1995 to $2899 depending on configuration, and with its tower systems: Intuit's $49.95 Quicken personal-finance software (Feb 95 ★★★★); Claris's $129 integrated software package (Feb 95 ★★★★, 1994 World-Class); Now Software's $129.95 system utilities collection (Jan 95 ★★★★, 1994 World-Class) and its $99 personal information manager bundle (Apr 95 ★★★★); and 300 Type 1 and TrueType fonts from Bitstream. Available directly from Power Computing only. Call 800/999-7279 (or E-mail **Info@powercc.com**) to specify options and to order.

◐ **QuickTake 150 Digital Camera + PhotoFlash 2.0** Apple Computer is including its $129 PhotoFlash photo-enhancement and -cataloging program (Jul 95 ★★★) and QuickTake Image Access software with its $739 QuickTake camera. The bundled software automates downloading and image enhancement, while providing extensive image-editing and -cataloging capabilities. Call the Apple Referral Center at 800/538-9696 for more information.

Targa 2000 + Adobe Premiere 4.0 Truevision is including Adobe's $795 video editor (Dec 94 ★★★★, 1994 World-Class) plus a $495 suite of transitions free of charge with its $5495 Targa 2000 nonlinear digital-video system—a NuBus card for digitizing, compressing, editing, and playback that can drive an RGB display at 1152 by 870 pixels in 24-bit color and output to a separate NTSC monitor. In addition, registered users of Radius or SuperMac digital-video systems can receive a 35 percent discount on Targa 2000 by trading in their cards. Call 800/858-8783 for more information. *Offer expires 6/30/95.*

◐ **Vision 3d 4.0 + Myst 1.0** Mac's Place at Egghead is offering a free copy of Broderbund Software's $59.95 Myst graphical adventure game (Mar 94 ★★★★) to customers who purchase Strata's $695 three-dimensional modeling, rendering, and animation package (Jul 95 ★★★★) on CD-ROM, for $419.95. Call Mac's Place at 800/905-0009 to order (#10242). *Offer expires 6/30/95.*

UPGRADES/SIDEGRADES

◐ **MapInfo for Power Macintosh** MapInfo is offering this $299 upgrade to its $1295 mapping program, which is functionally identical to MapInfo for Macintosh 3.0, to current MapInfo 2.X or 3.X owners, for $99. Call 518/285-6000 for more information. *Offer expires 6/30/95.*

◐ **MicroStation V5** Bentley Systems is offering this $3950 professional 3-D CAD program for $1500 to registered users of AutoCAD, VersaCAD, MacBravo, and ClarisCAD. Call 800/778-4274 for more information and to order.

SPECIAL DISCOUNTS/OFFERS/RESOURCES

Andyne Pablo Andyne Computing is offering this $695 database-query program, which provides multidimensional summary information for any client-server architecture, for $395. Free demo disk available. Call 800/267-0665 to order. *Offer expires 6/30/95.*

CaLANdar 3.0 Microsytems Software is offering its $595 (10-user), $995 (20-user), and $1995 (50-user) cross-platform LAN site licenses for this appointment scheduler, for $495, $795, and $1295, respectively. Multiuser mail-enabled versions are also available. Call 800/489-2001 for more information. *Offer expires 6/30/95.*

MarcoPolo 3.0; ◐ VIP-C 1.5; ◐ VIP-BASIC 1.5 Mainstay is offering its $895 MarcoPolo document-imaging and -management software (Jan 95 ★★★★) for $595. Its $495 VIP-C programming utility (Feb 95 ★★★★) is available for $295, and its $295 VIP-BASIC programming language (Jun 94 ★★★ for version 1.0.1), for $99. Call Mainstay at 800/484-9817 (code 4636) to order. *Offer expires 7/31/95.*

OptiMem RAM Charger 2.0.1 Jump Development Group is offering this new $129 version (Jul 95 ★★★★) of its OptiMem memory-management utility for an introductory price of $59.95. Call 800/586-7622 to order and to obtain a demo disk for $4.95 S&H; or send E-mail to **jumpdev@netcom.com** with **info request** in the subject field to receive a free demo, which can be transformed into a permanent licensed and registered copy for $49.95. *Offer good through at least 6/30/95.*

URW DeSign Collection URW America is offering this $1399 collection of 870 PostScript Type 1 fonts, created for use at display sizes, for $999. Call 800/229-8791 for more information and to order. *Offer expires 8/31/95.* m

Everything you expect in a great Mac monitor, plus more.

Two of the best names in video displays have joined forces to bring you a unique feature in monitors for the Mac — a fabulous price.

You probably know RasterOps as one of the most respected names in Mac graphics. But you may not know that Hitachi has been building Mac monitors for over a decade. Hitachi is one of the most respected names in the industry known for designing and building high quality, reliable products. The SuperScan line offers ultra-high resolutions, remarkably quick refresh rates, extremely sharp edge-to-edge focus, easy-to-use front panel controls that will satisfy the needs of the most discriminating users.

Call for details and your nearest dealer. **(800) 441-4832.**

MPR II

3-year warranty

RASTEROPS®

HITACHI

SuperScan®

An advantage you can clearly see.

Ingram Micro (800) 456-8000. **Merisel** (800) 637-4735. **Tech Data** (800) 237-8931.

* Macworld Editors' Choice, November 1994. MacUser Editors' Choice, March 1994. The Energy Star™ emblem does not represent EPA endorsement of any product or service. All brands and product names are trademarks or registered trademarks of their respective companies.

Circle 74 on reader service card

Macworld Advertiser Index

Say you saw it in Macworld. To purchase products advertised in this issue call the phone numbers below or use the reader service number for our FastFacts Product Information Card located after the product index.

Page No.	Advertiser	Reader Srvc. No.	Phone
95	Adam Software Inc.	22	800/408-2326
51	Adobe	231	800/521-1976
196	Advanced Business Center	225	800/723-8262
32	Agfa	43	800/685-4271
40	Agfa	156	800/685-4271
8	Agio	—	800/688-2446
188-189	Alliance Peripheral Systems	62	800/874-1428
96-97	American Power Conversion	72	800/788-2208
12	Anthro	—	800/325-3841
23	Apple Computer	—	—
142	Apple Computer	—	—
150	Apple Computer	—	—
194-195	BottomLine Distribution	63	800/990-5796
206	CD ROM Expo	—	—
53	CE Software, Inc.	170	800/523-7638
203-205	CRA Systems Inc.	20	800/375-9000
11	Caere Corporation	69	800/535-SCAN
116-117	Canon Inc.	109	800/962-2708
173	ClubMac	96	800/ CLUB MAC
202	Compu-D	84	800/929-9333
190-191	Computer Discount Warehouse	2	800/861-4CDW
48	Connectix	192	800/950-5880
50	Connectix	191	800/950-5880
146	Corel Corporation	78	800/836-3729
145	Datawatch Corporation	—	508/988-9700
46	DayStar Digital	7	800/532-7853
13	Delphi	173	800/695-4005
21	Deneba Software	57	800/733-6322
194-195	DGR Technologies	63	800/990-5796
176	DigiCore	269	800/858-4622
196	Digital Axis	83	800/747-7555
131	DiiMo Technologies	299	800/503-4466
175	Direct Connections	121	800/572-4305
184	Direct Tech	298	800/279-5520
197-199	DirectWare	88	800/490-WARE
237	Educorp	157	800/843-9497
10	Engineered Software	12	910/299-4843
30-31	Fujitsu	202	800/831-4094
49	HSC Software	5	805/566-6200
64	Hewlett Packard	—	—
78	Hewlett Packard	—	—
39	Hewlett Packard	11	—
162	Hitachi NSA	74	800/441-4832
8	IMAXIS	105	800/462-9470
20	Image Club	50	800/387-9193
18	Insignia Solutions	68	800/848-7677
26	Inspiration Software	—	800/877-4292
182-183	J&R Computerworld	282	800/221-8180
BC	Kensington Microware, Ltd.	—	800/535-4242
15-17	LaCie	52	800/999-1422
200-201	Mac Bargains	70	800/619-9091
185	Mac Zone	71	800/436-0606
68	MacAcademy	106	800/527-1914
82-83	MacConnection	—	800/800-3333
167-172	MacMall	131	800/222-2808
174	MacProducts	65	800/347-0028
192-193	MacWarehouse	150	800/255-6227
6-7	Macromedia	243	800/326-2128
29	Macromedia	244	800/326-2128
149	Mactivity	—	—
207	Macworld Expo	—	—
132-137	Macworld Expo-Boston	—	—
180	MegaHaus	245	800/786-1184
IFC -1	Microsoft	—	—
2-3	NEC Technologies	15	800/NEC-INFO
IBC	NEC Technologies	16	800/NEC-INFO
127	Nisus	—	800/647-8794
70	Panasonic Communications & Systems	86	800/742-8086
80	Performance Systems International	95	800/82PSI82
27	Pinnacle Micro	115	800/553-7070
44	Polaroid	295	800/816-2611
66	Pro CD	217	800/992-3766
181	ProDirect	135	800/524-9952
24	QMS	—	800/392-7559
28	Reply Corporation	—	800/801-6898
128	Samsung Electronics America, Inc.	198	800/933-4110
72	Seiko Instruments	93	800/888-0817
177-179	Spin Peripherals	248	800/215-9200
42	Statsoft	99	918/583-4149
124	Strata	114	800/Strata3d
186-187	SuperMicro	126	800/352-3415
105	Texas Instruments	266	800/527-3500
74	Toyota	—	800/GO-TOYOTA
91	Truevision	124	800/SAY-COLOR
76	Umax	196	800/859-2728
140	Viking Components	233	800/338-2361
9	Visioneer	18	800/787-7007
54-55	WordPerfect Corporation	—	800/526-7820
47	Xante Corporation	112	800/926-8839

Macworld Product Index

A quick and easy product index from Macworld. Simply use this index to find the page or advertiser of the products which interest you. Then, use the reader service number for our FastFacts Product Information Card located on the following page.

Page No.	Advertiser	Reader Srvc. No.
SOFTWARE		
BUSINESS		
26	Inspiration Software	—
IFC -1	Microsoft	—
42	Statsoft	99
54-55	WordPerfect Corporation	—
CAD/CAM		
10	Engineered Software	12
CD ROM		
146	Corel Corporation	78
237	Educorp	157
66	Pro CD	217
74	Toyota	—
ENTERTAINMENT		
95	Adam Software Inc.	22
146	Corel Corporation	78
GRAPHICS/DTP		
51	Adobe	231
21	Deneba Software	57
49	HSC Software	5
20	Image Club	50
6-7	Macromedia	243
29	Macromedia	244
MISCELLANEOUS		
26	Inspiration Software	—
MULTIMEDIA		
95	Adam Software Inc.	22
6-7	Macromedia	243
29	Macromedia	244
NETWORKING		
53	CE Software, Inc.	170
OCR		
11	Caere Corporation	69
ONLINE		
80	Performance Systems International	95
STATISTICAL		
42	Statsoft	99
UTILITIES		
48	Connectix	192
18	Insignia Solutions	68
WORD PROCESSING		
127	Nisus	—
HARDWARE		
BOARDS		
46	DayStar Digital	7
131	DiiMo Technologies	299
28	Reply Corporation	—
CD ROM		
237	Educorp	157
IBC	NEC Technologies	16
COMPUTER SYSTEMS		
203-205	CRA Systems Inc.	20
186-187	SuperMicro	126
DIGITIZERS/SCANNERS		
32	Agfa	43
40	Agfa	158
196	Digital Axis	83
64	Hewlett Packard	—
8	IMAXIS	105
76	Umax	196
DISPLAY		
203-205	CRA Systems Inc.	20
196	Digital Axis	83
162	Hitachi NSA	74
2-3	NEC Technologies	15
44	Polaroid	295
128	Samsung Electronics America, Inc.	198
EXPANSIONS/UPGRADES		
46	DayStar Digital	7
131	DiiMo Technologies	299
140	Viking Components	233
FURNITURE		
8	Agio	—
HARD DISKS/STORAGE		
188-189	Alliance Peripheral Systems	62
194-195	BottomLine Distribution	63
173	ClubMac	96
194-195	DGR Technologies	63
175	Direct Connections	121
184	Direct Tech	298
30-31	Fujitsu	202
15-17	LaCie	52
174	MacProducts	65
180	MegaHaus	245
70	Panasonic Communications & Systems	86
27	Pinnacle Micro	115
181	ProDirect	135
186-187	SuperMicro	126
140	Viking Components	233
INPUT DEVICES		
BC	Kensington Microware, Ltd.	—
9	Visioneer	18
MISCELLANEOUS		
96-97	American Power Conversion	72
PRINTERS		
116-117	Canon Inc.	109
39	Hewlett Packard	11
78	Hewlett Packard	—
24	QMS	—
72	Seiko Instruments	93
105	Texas Instruments	266
47	Xante Corporation	112
SECURITY		
96-97	American Power Conversion	72
145	Datawatch Corporation	—
UTILITIES		
145	Datawatch Corporation	—
VIDEO		
50	Connectix	191
91	Truevision	124
SERVICES		
ON LINE		
13	Delphi	173
TRADESHOWS/CONFERENCES		
206	CD ROM Expo	—
149	Mactivity	—
207	Macworld Expo	—
132-137	Macworld Expo-Boston	—
TRAINING		
68	MacAcademy	106
ACCESSORIES		
FURNITURE		
12	Anthro	—
MAIL ORDER		
196	Advanced Business Center	225
188-189	Alliance Peripheral Systems	62
194-195	BottomLine Distribution	63
173	Club Mac	96
202	Compu-D	84
190-191	Computer Discount Warehouse	2
203-205	CRA Systems Inc.	20
194-195	DGR Technologies	63
176	DigiCore	269
175	Direct Connections	121
184	Direct Tech	298
197-199	DirectWare	88
182-183	J&R Computerworld	282
200-201	Mac Bargains	70
185	Mac Zone	71
82-83	MacConnection	—
167-172	MacMall	131
174	MacProducts	65
192-193	MacWarehouse	150
180	MegaHaus	245
181	ProDirect	135
177-179	Spin Peripherals	248

Macworld

JUST FOR YOU. FREE PRODUCT INFORMATION FROM MACWORLD.

There's no cost or obligation. We even pay the postage! Simply fill in the questionnaire, then circle the numbers on the card below for the products that interest you. Numbers for advertised products can be found in the ad and in both the Product Index and Ad Index. Fold card and mail. No staples please.

FASTFAX
For faster results just fax this sheet to +1-415-637-4343. Please indicate your fax number where indicated.

Please answer these questions so that we may better serve you.

A. Including yourself, approximately how many people are employed at your entire work-site (i.e., employees in your office, building, or cluster of buildings)? (Check one.)
- 01 ❑ 1000+
- 02 ❑ 999 - 100
- 03 ❑ 99 - 25
- 04 ❑ Under 25

B. Which of the following computers are installed at this entire work-site? (Check all that apply.)
- 05 ❑ Apple Workgroup Servers/ Mac Quadra-series
- 06 ❑ Mac Centris-series/II-series/LC III/ Performa 600/450/SE 30
- 07 ❑ Mac LC/LC II/Performa 430/405/ 400/200/Classic-series/SE/Plus/ 512K/128K/Portable
- 08 ❑ Mac PowerBook-series/Duo-series

C. What is the total number of Macs installed at this entire work-site? (Check one.)

D. For how many Macintosh computers within this entire work-site do you have purchase involvement for products and/ or services? (Check one.)

	C	D
500+	❑ 09	❑ 15
499 - 100	❑ 10	❑ 16
99 - 50	❑ 11	❑ 17
49 - 10	❑ 12	❑ 18
9 - 1	❑ 13	❑ 19
None	❑ 14	❑ 20

E. In which ways are you ever involved in purchase decisions for Macintosh products at this entire work-site? (Check all that apply.)
- 21 ❑ Initiate/Determine need for product/capabilities/features
- 22 ❑ Evaluate, recommend, or approve brands/models
- 23 ❑ Evaluate, recommend, or approve purchase source
- 24 ❑ Authorize purchases

F. Over the next 12 months, how much will this entire work-site spend on Macintosh products and/or services? (Check one.)
- 25 ❑ $1 million or more
- 26 ❑ $999,999 – $500,000
- 27 ❑ $499,999 – $100,000
- 28 ❑ $99,999 – $50,000
- 29 ❑ $49,999 – $10,000
- 30 ❑ Under $10,000

G. Considering the entire work-site, which of the following Macintosh hardware and software products are currently installed? (Check all that apply.)
- 31 ❑ Business software (Word processing, spreadsheet, database, etc.)
- 32 ❑ Graphics/publishing software
- 33 ❑ Monitors/displays
- 34 ❑ Printers/scanners
- 35 ❑ Networking/communications hardware and/or software
- 36 ❑ Multimedia/AV hardware and/or software
- 37 ❑ Mobile computing products (PowerBooks, peripherals, software, etc.)

H. What is your primary job function? (Check one.)
- 38 ❑ Computer Reseller/VAR/VAD
- 39 ❑ MIS/DP/IS/Network Management
- 40 ❑ Engineering
- 41 ❑ R&D/Scientific
- 42 ❑ Corporate/General Management
- 43 ❑ Accounting/Finance
- 44 ❑ Marketing/Sales/PR/ Communications
- 45 ❑ Art/Design/Creative Services

Thank You!

Please print or type all information.

Title_____

Co._____

Phone_____

Fax_____

Free Product Information

1	2	3	4	5	151	152	153	154	155
6	7	8	9	10	156	157	158	159	160
11	12	13	14	15	161	162	163	164	165
16	17	18	19	20	166	167	168	169	170
21	22	23	24	25	171	172	173	174	175
26	27	28	29	30	176	177	178	179	180
31	32	33	34	35	181	182	183	184	185
36	37	38	39	40	186	187	188	189	190
41	42	43	44	45	191	192	193	194	195
46	47	48	49	50	196	197	198	199	200
51	52	53	54	55	201	202	203	204	205
56	57	58	59	60	206	207	208	209	210
61	62	63	64	65	211	212	213	214	215
66	67	68	69	70	216	217	218	219	220
71	72	73	74	75	221	222	223	224	225
76	77	78	79	80	226	227	228	229	230
81	82	83	84	85	231	232	233	234	235
86	87	88	89	90	236	237	238	239	240
91	92	93	94	95	241	242	243	244	245
96	97	98	99	100	246	247	248	249	250
101	102	103	104	105	251	252	253	254	255
106	107	108	109	110	256	257	258	259	260
111	112	113	114	115	261	262	263	264	265
116	117	118	119	120	266	267	268	269	270
121	122	123	124	125	271	272	273	274	275
126	127	128	129	130	276	277	278	279	280
131	132	133	134	135	281	282	283	284	285
136	137	138	139	140	286	287	288	289	290
141	142	143	144	145	291	292	293	294	295
146	147	148	149	150	296	297	298	299	300

Free Macworld Shopper Information

401	402	403	404	405	501	502	503	504	505
406	407	408	409	410	506	507	508	509	510
411	412	413	414	415	511	512	513	514	515
416	417	418	419	420	516	517	518	519	520
421	422	423	424	425	521	522	523	524	525
426	427	428	429	430	526	527	528	529	530
431	432	433	434	435	531	532	533	534	535
436	437	438	439	440	536	537	538	539	540
441	442	443	444	445	541	542	543	544	545
446	447	448	449	450	546	547	548	549	550
451	452	453	454	455	551	552	553	554	555
456	457	458	459	460	556	557	558	559	560
461	462	463	464	465	561	562	563	564	565
466	467	468	469	470	566	567	568	569	570
471	472	473	474	475	571	572	573	574	575
476	477	478	479	480	576	577	578	579	580
481	482	483	484	485	581	582	583	584	585
486	487	488	489	490	586	587	588	589	590
491	492	493	494	495	591	592	593	594	595
496	497	498	499	500	596	597	598	599	600

❑ Check box and fill in the appropriate information to subscribe to Macworld. You will be billed $24.00 for a 1-year (12 issue) subscription (U.S. only).

Expires September 8, 1995 S1 July 1995

50% RECYCLED PAPER 10% Post Consumer Waste

PATRICIA G MIRANDA
4208 SHADY BEND DR
DALLAS TX 75244

FREE PRODUCT INFORMATION.

Get valuable information about the products that interest you. There's no cost; no obligation. Just fill out both sides of this FASTFACTS Information form. Circle the numbers for the desired products. Then mail the card. We pay the postage! For even faster results fill out and send the card via our FASTFAX. Now fast… get the facts, the competition's gaining on you.

Macworld

FOLD HERE AND CLOSE WITH TAPE. DO NOT STAPLE!

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 215 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

Macworld

Reader Service Department
P.O. Box 5299
Pittsfield, MA 01203-9906

CREATIVE COMPUTERS

MacMall

YOUR MAC SUPERSOURCE!™

Since 1985

THE LARGEST AUTHORIZED FULL LINE APPLE MACINTOSH® MAIL-ORDER SUPERSTORE!

Verified low prices with over 2500 products on sale!

Lower Than Warehouse Prices!!

BEST BUYS!!

Hi-Val Quad-Speed External CD-ROM Drive

$249.99* #70038

with FWB CD-ROM Toolkit

*while supplies last

TelePort Platinum™ 28.8 V.34 External Data/Fax Modem

$234.99 #70098

IOMEGA 100MB Removable Hard Drive

Includes one 3.5" 100MB cartridge

$199.99 #69404

New Lower Prices on Macintosh® and Performa® computers!

Authorized Catalog Reseller

CALL TODAY FOR YOUR FREE CATALOG!!

800-222-2808

WE HAVE THE LARGEST SELECTION OF APPLE® PRODUCTS!!

200MB SyQuest Drive

Reads and writes 88MB and 44MB cartridges. Includes cable and software. Does not include cartridge

For only $389.99 #72029

USC Live Picture

Experience the new face of image processing. Manipulate and modify large image files with complete creative freedom.

$599.99 #69382

FASTEST DELIVERY SERVICE GUARANTEE!!

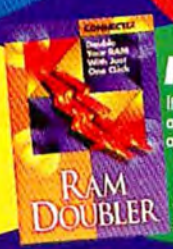
"MacMall will deliver your order by 10:30am THE NEXT DAY or pay for your shipping!"*

*Limited to in-stock orders placed before 8pm (EST) not requiring configuration and delivered by FedEx® delivery service to destinations within the contiguous U.S. (*Next Day* not available to certain rural areas.)

Adobe™ Photoshop 3.0 Upgrade

Upgrade to the latest version of world's leading photo design and production tool.

$144.99 #67319



CONNECTIX Ram Doubler

It gives your Mac™ twice as much memory to open 1.5 as many applications

*With Microsoft® Word, Microsoft® Excel or CPU purchase.

$49.99* #66970

1•800•222•2808

Fax 310-222-5800 • Customer Service 800-560-6800

FedEx® Priority Overnight Delivery by 10:30am! $3 Per Order†

FedEx Federal Express

CREATIVE COMPUTERS
MacMall
YOUR MAC SUPERSOURCE!

To Order, Call Toll Free
PRIORITY CODE: D572MG14

1•800•222•2808

Call today for your FREE Catalog!!

Fax: 310-222-5800
Customer Service: 800-560-6800
International Orders: 310-787-4500
Mail: MacMall Order Dept., 2645 Maricopa St., Torrance, CA 90503-5144

VERIFIED LOW PRICES
MacMall has it all!!!
If you see a lower price not advertised in this magazine, please call us and we'll do our very best to BEAT that advertised price.

EPSON

Stylus Color Printer W/Mac™ interface
720x720 DPI Color Ink Jet

Print vivid color with clarity never before possible in a personal printer, with EPSON Stylus Technology. This exclusive technology produces a very precise dot, eliminating feathering. 360 dpi blacks and colors are crisper and sharper. Plus, with special paper, get even sharper 720 dpi color images.

#68178 $549.99

- Extra sharp printing
- True 720 dpi resolution
- Micro-weaving, micro-halftoning and microfeeding for the best color yet
- Windows™ & Mac™ compatible
- Built-in paper sheet feeder allows you to easily print letter, legal, envelopes and transparencies
- Specially designed software speeds up printing time so you can get back to work almost immediately
- Two year limited warranty and toll free technical support

Epson Apple LocalTalk® Interface*
Allows you to share the Stylus over AppleTalk® Networks.
*Interface replaces Mac™ Serial Port. Installation Available for $30.00 #2214
#68785 $134.99

VISTA-S6LE ★★★½
4800 dpi, High Speed, Low Cost, Single Pass, Color Scanning Solution

The new Vista-S6, with its micro-stepping motor, is designed to reduce scanning time and speed up your daily work load. Magic Match (Umax's own color management technology) which provides accurate and vivid color

- Supports up to 8.5"x11" material
- SCSI 2 interface with cable included
- Scans black and white, color & line art
- Single pass with single cold lamp technology
- Includes Adobe™ Photoshop LE, Omnipage Direct
- De-screening, auto-density adjustment, filtering function
- Optical resolution of 300 x 600 dpi
- TWAIN compliant

#65829 $659.99

UMAX POWERLOOK ★★★★
It Beats Other Flatbed Scanners...Like a Drum.
Single Pass Scanner w/ transparency

Designed for professional pre-press applications. The first flatbed with true 3.0 dynamic range.

•30 bit scanning mode recognizes more than one billion colors and 1, 024 shades of gray (10-bits per pixel); true 30-bit output! • Single pass CCD imager captures 30-bit color without the need for prisms, filters or color lamps. This gives you superior images with outstanding reliability •Includes full version Adobe™ Photoshop 3.0 and Kai's Power Tools SE •9600 dpi maximum scanning resolution (interpolated) with 1200 x 600 optical •Supports color, grayscale, halftone and line art modes •Built-in SCSI-II interface •Scaling from 1% to 400% in 1% increments

POWERLOOK
1200 x 600 (2400) single pass scanner w/o transparency or software $2499.99 #68859

$2999.99
#66132

UMAX™ Vista T630
The "Next Generation" of the UC630

24-bit, three pass RGB filters brings out the richness and detail of original images. Vista-T630 extends resolution from an optical 300x600dpi to a maximum 4800dpi thru enhanced UltraView Technology. Maximum scanning area of 8.5"x11.7" and scanning times as low as 3.5 seconds. VistaScan® automates scanning controls to a single step process, auto-density features and descreening. Bundled with Photoshop LE and Wordlink OCR.

#70754 $498.99

Vista T630
with Adobe Photoshop LE and Omnipage Direct and Corel Professional Photo CD $569.99 #70755

MacMall BEST BUYS!!!

HP DeskWriter 310
w/ sheet feeder & color kit

- Crisp 300 dpi black and optional color printing • Fast-up to 3 ppm
- Compact and lightweight for easy portability • Lightweight international power adapter with automatic voltage switching

#68879 $289

WTI-VideoMax™

WTI-VideoMax™ is an inexpensive stand alone solution for recording live video from your Macintosh® II computer to video tape. It connects directly to the output of your Apple® (or compatible) display card. WTI-VideoMax™ has two outputs one which gives you the NTSC or PAL compatible video signal and another which connects to you existing display monitor.

#67579 $49.99

ASANTÉ™
WorldClass Networking Products

10Base-T Ethernet Cards

Asanté MCLC10TIII
10BaseT Ethernet Card
LCIII Style ..... $49.99 #67642

AsantéLite
10BaseT Ethernet Card
LCIII Style ..... $49.99 #67644

Asanté MCLC10TIII
Thin Ethernet Card
LCIII Style ..... $69.99 #67643

Above products work with Apple® Macintosh Quadra®/Performa® 630, LCII, LCIII, Performa® 475, 550, 575, 577, 578 and Macintosh Quadra® 605 models

Ikegami 20" Ultra High Resolution Trinitron® Display

Ikegami's 20-inch color monitor the CT-20. provides high-speed horizontal scanning, flicker free vertical scanning and wide band video circuitry.
• 20 inch high resolution monitor with Trinitron® CRT • Antiglare coating • Compact and lightweight • High reliability • Up to 1280x1024 resolution.

#68399 $999

Rokan C/DAS Laptop Security System

Each C/DAS kit includes everything you need to protect your laptop computer from theft. Just attach the patented sensor device to your computer, connect one cable between the sensor and the Control Unit, plug-in the AC adapter and ARM your system. From that point on, any attempt to remove the sensor or unplug the cable, disconnect the AC power supply, or even tamper with the Control Unit itself will immediately sound the 110db alarm! Quick, easy and inexpensive.

#65816 $249.99

10Base-T FriendlyNet Adapter

Asanté 10BaseT FriendlyNet Adapter ..... $54.99 #65700

Works with Apple® Powerbook® 500, PowerMac™, Macintosh Quadra® & Centris®

FOCUS enhancements
connectivity • graphics • software

Networking Solutions

Focus has over 1,300,000 Mac™ networking customers around the world!

Ethernet Trancievers

EtherLAN FN Thin AAUI	#66059	$39.99
EtherLAN TR - FN - T 10Base AAUI	#66064	$39.99

Rack Mount & Desktop Hubs

EtherLAN Hub 9	#69395	$169.99
EtherLAN Hub 16 RM	#69397	$409.99
EtherLAN Hub 16 V	#69396	$429.99

Ethernet Cards

EtherLAN II-T (10BaseT, MacII, NuBus)	#66062	$79.99
EtherLAN LC (LC, LCII & thin)	#66065	$79.99
EtherLAN (10BaseT for LC, LCII, LCIII, Color Classic)	#66066	$72.99

EtherLAN Print

Print Plus (6 Devices supported)	#64441	$334.99
Print (2 Devices supported)	#64442	$274.99

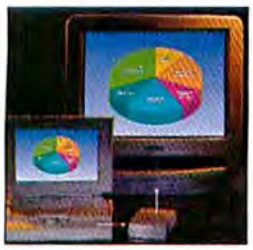
TurboNet STDIN-8
Apple Local Talk® Connectors

Apple LocalTalk® Phonenet connector #66056 $13.99

FOCUS enhancements
connectivity • graphics • software

Graphics Solutions

TV Presentations On The Go!



L•TV Portable

L•TV Portable is designed to display what's on your Mac/PC onto a TV, or record to VCR. Ideal for Educators, Trainers, Corporate Presenters and home Multimedia users. Works with any Mac/PC with a VGA video out signal. Simultaneous video support with VGA monitors. All cables supplied.

#64434 $214.99

L•TV Portable Pro

FOCUS L•TV Portable Pro adds support of all Apple 13/14" RGB monitors, as well as all the features of the L•TV Portable.

#66055 $269.99

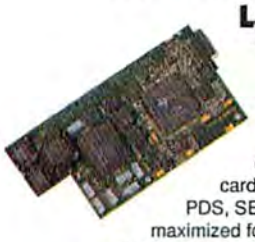
Create on your Macintosh and instantly display with TV or tape with your VCR.

L•TV Pro LC 575

FOCUS L•TV cards are an internal Video Presentation solution for any Nubus or LC-PDS Mac (now supports the LC 520/575!!!) with the same high quality as the L•TV Portable. #64435 $299.99

"...I Recommend the L•TV Portable..." David Pogue of MacWorld Magazine. January 1995

LC 24 Bit Color for Less!



Lapis Color LC 2421 for LC

The LC 2421 card is compatible with all LC/Performa Mac systems with an LC-PDS slot— including, Quadra 630 and 605, LC I, LC II, LC III, LC 475, LC 520 and LC 575! If you want more colors and/or video expansion, the LapisColor 16 and 24-Bit cards are available for any Mac that has an LC-PDS, SE30/IIsi or Nubus expansion slot. All cards are maximized for speed, easily installed and support virtually any Apple or 3rd party color display. All cards come with easy-to-install software and necessary video connectors. 3-year warranty.

#66961 $469.99

Other great graphics cards to choose from,

Lapis Color 16 for LC #66960 $349.99

Focus cards work with most Monitors in the industry. Apple®, Radius, RasterOps, SuperMac, and Sony.

To Order, Call Toll Free

PRIORITY CODE: D572MG14

1•800•222•2808

MacMall Now Open 24 Hours!!

CREATIVE COMPUTERS MacMall YOUR MAC SUPERSOURCE!

CREATIVE COMPUTERS
MacMall
YOUR MAC SUPERSOURCE!

To Order, Call Toll Free

PRIORITY CODE: D572MG14

1•800•222•2808

Call today for your FREE Catalog!!

Fax: 310-222-5800
Customer Service: 800-560-6800
International Orders: 310-787-4500
Mail: MacMall Order Dept., 2645 Maricopa St., Torrance, CA 90503-5144

MacMall is your SUPERSOURCE!! WIDE Selection
If you are looking for a Macintosh® peripheral or accessory and don't see it then give us a CALL! We do our best to carry just about everything!

Put a PC inside your Mac™!!

Imagine combining the advantages of your Macintosh® computer with the freedom to run DOS and Windows™ software. Now, the DOS on Mac™ Card from Reply provides an inexpensive and convenient solution for Mac™ home users with DOS systems at work, business users in mixed DOS and Mac™ environments, or Mac™ users with a requirement for specific software only available in a DOS format. Because the DOS on Mac™ Card is designed with a dedicated DOS system. And it's easy to switch back and forth between Macintosh® and DOS environments. Just hold down the Command key and press Return.

- Run applications for DOS and Windows™ on your Macintosh® computer
- Switch from the Mac™ environment to DOS instantly - without quitting the Macintosh® applications you're using
- Open DOS and Windows™ files from the Macintosh® environment with Macintosh PC Exchange™ software
- Use Macintosh®, DOS or Windows™ CDs on your Mac™ with the DOS on Mac™ card.
- Copy and paste information between Macintosh® applications and DOS or Windows™ applications
- Share memory installed on your Mac™ with the DOS on Mac™ card, or add up to 32MB industry standard memory to enhance the performance of DOS and Windows™ applications
- Connect a PC game controller or joystick to use with games for DOS and Windows™

for Macintosh Quadra® & Centris® 650, 700, 800, 900 and 950 w/ DOS, Windows™ and Soundblaster #68562

for Macintosh Quadra® or Centris® 610 w/ DOS, Windows™ and Soundblaster #68563

$824.99

Wacom Quality + Fractal Creativity = The Perfect Pair!

WACOM

Wacom graphic tablets are widely recognized as the de-facto standard for their quality and natural feel. And every Wacom tablet comes with the Wacom UltraPen™, the only perfectly balanced, batteryless, cordless, pressure sensitive pen available. Now, Wacom Technology offers these great tablets alone or bundled with Fractal Design graphic software. Match up your choice of any 3 Wacom tablets with the hot new Fractal Painter 3 for an exceptional professional-quality value deal! Or, get the Wacom ArtPad with Dabbler for an excellent entry level package. Either way, you get a perfect match of Wacom Quality and Fractal Creativity!

ArtPad 4"x5" Graphics Tablet ..... $148.99 #67146
ArtPad 4"x5" w/Dabbler 1.0..... $178.99 #66950
ArtPad 4"x5" w/Painter 3 ..... $429.99 #67656

ArtZ 6"x8" Graphics Tablet

World's first high-speed ADB compatible graphics tablet. A new tablet with a natural feeling pressure sensitive stylus with side-switch. The batteryless, cordless UltraPen™ has 256 levels of sensitivity.

#60962 $299.99

UD-1212-RM Graphics Tablet

The UD-12x12 tablet is the perfect fit for any computer artist! Features include a full menu strip, 256 levels of pressure, a transparent overlay surface, a cordless, batteryless UltraPen™ and more powerful interactive interface!

*Price reflects $40 mail-in rebate from Wacom. Price before rebate is $499.99. Offer ends 6/15/95.

#62484 $459.99*

Powercard™ 601

DAYSTAR DIGITAL

Turn Your Macintosh® LC, Performa® or Quadra® 470, 570, 605 and 630 series into a PowerMac™

PowerCard 601 brings Power Macintosh™ performance to the latest family of entry-level Macintosh® computers. Developed in partnership with Apple®, this inexpensive PowerPC™ upgrade provides PowerMac™ performance for half the cost of a new machine. It is easy to install, and includes a 256K cache and System 7.5. And like the Power 601, the PowerCard 601 not only works with your current Mac™ memory, it lets you run software on your Mac™ either as a PowerPC™ or 68K based machine.

$639.99 #67669

Turbo™ 601

Turn Your Macintosh® IIci into a PowerMac™!

Turbo 601 brings real Power Macintosh™ performance to your Mac™ IIci in an easy to install PDS upgrade card. Turbo 601 runs as much as 11 times faster than a Mac™ IIci without an upgrade. It even provides faster performance for 68k based applications. Get the best of both worlds because you can switch back to your 68030. Based on award winning design of DayStar's Turbo 040, we've added a 66MHz PowerPC™ processor, Apple® Macintosh® ROMs and a 256K secondary cache.

$999.99 #67670

ScanMaker IIHR LE

The three pass ScanMaker II HR offers vivid 24-bit-per-pixel color scans at an optical resolution of **600 X 1200 dpi (2400 dpi software enhanced)** which allows you to achieve sharper, more richly defined details than ever before. The ScanMaker IIHR produces true, life-like colors and sharp images perfect for demanding graphic arts applications and includes ***Adobe™ Photoshop LE and OminPage Direct.***

$799.99 #69353

ScanMaker IIHR w/ Adobe™ Photoshop 3.0, and OmniPage Direct..... $1067.99 #69352

ScanMaker II

This scanner uses a three-pass scanning method to capture full 24-bit color or 256 shades of grey. Features 300 dpi horizontal X 600 dpi vertical resolution, with a maximum of 1200 dpi X 1200 dpi through interpolation. Includes MicroFrontier's ***Color It!, OmniPage Direct*** and scan module with Automatic Contrast Control and Display Matching System, making it a snap to get great looking images on the first try.

NEW VERSION

$474.99 #69357

MICROTEK™

ScanMaker 35t

Great 24-bit color and 8-bit grayscale from your 35mm slides or filmstrip! ScanMaker 35t offers a maximum of 3656 dpi in either landscape or portrait orientation. The powerful scanning software provided by Microtek™ contains many image enhancing options to ensure crisp, clear color. ScanMaker 35t includes a copy of ***Adobe™ Photoshop LE*** for incredible image editing on your Macintosh®.

$988.99 #66739

ScanMaker IISP

The new single-pass ScanMaker IISP Color Flatbed Scanner with DCR™, the most accurate color system calibration available for the desktop, is another price/performance breakthrough from Microtek. Accurate color calibration for more vibrant, saturated and true color which used to be only available at a premium price on high-end scanning equipment. It is also Apple® ColorSync® compatible. Comes complete with ***OmniPage Direct.***

$539.99 #69355

PhoneDisc '95

The only CD phone directory voted one of MacUser's 50 Best CD's

The fastest way to find anyone, anywhere! America's Phone Book on CD-ROM!

The Most Accurate CD Directory Available

Jump start your sales, boost your productivity, expand your customer base or just find an old friend. PhoneDisc '95 - America's Phone Book on CD - delivers 90 million of the most accurate and complete directory listings nationwide. That's 90 million listings you can look up, print or export into your favorite contract manager. *With absolutely no restrictions on printing or exporting,* ZIP + 4 information, six-digit SIC codes, customized mailing labels, and reverse search indexing, PhoneDisc '95 will spark new ideas for marketing and sales opportunities or take you for a walk down memory lane. Try PhoneDisc '95 and open up a whole new world of possibilities. Proven to be 95% accurate!

Publisher: Digital Directory Assistance

PhoneDisc '95 PowerFinder

The Master Investigative Tool

- 90 million business and residential listings on five regional CDs.
- Reverse indexing finds a residence or business listing from an address, phone number or business type.
- Narrow name or business type searches by city, state street, ZIP and/or area code
- Includes 2,000 categories of six-digit SIC code for business searches.

#67413 **$145.99**

PhoneDisc '95 Residential

The Nation's White Pages on CD

- Contains over 80 million directory listings nationwide.
- Search by name, narrow a search by city, state, street, ZIP and/or area code.
- Excludes reverse indexing to allow convenient two disc name searching of all 80 million listings.

#67410 **$48.99**

PhoneDisc '95 Business

The Top Rated Business Directory

- 9.5 Million U.S. listings fully indexed on just one CD.
- Includes 2,000 different categories of six-digit SIC codes.
- Reverse indexing helps you find a business from just an address or phone number.

#67411 **$48.99**

PhoneDisc Combo Pack

Residential and Business bundled together!

#67412 **$78.99**

EXTREMELY SHOCK-RESISTANT

NOMAI™

The Nomai™ Family of SyQuest® compatible **REMOVABLE CARTRIDGES** provides the optimum in data storage performance. Nomai™ cartridges are the most shock-resistant cartridges available on the market today. In a recent MacUser review, Senior Editor Mark Frost said, "We mailed 'em, cooked 'em, magnetized 'em and dropped 'em - and these removable cartridges came back for more... None of the cartridges suffered any data loss!" This **TREMENDOUS SHOCK-RESISTANCE** is obtained by DLC (Diamond Like Coating). DLC protects against airborne particles which results in a long-life cartridge you can trust.

PREFORMATTED and backed by a **5 YEAR WARRANTY**, Nomai™ offers unparalleled dependability and performance at an **UNBEATABLE PRICE.**

NEW LOW PRICE!

44MB $39.99 #66229

88MB $44.99 #66230

To Order, Call Toll Free

PRIORITY CODE: D572MG14

1•800•222•2808

MacMall Now Open 24 Hours!!

CREATIVE COMPUTERS MacMall YOUR MAC SUPERSOURCE!

CREATIVE COMPUTERS
MacMall
YOUR MAC SUPERSOURCE!

To Order, Call Toll Free

PRIORITY CODE: D572MG14

1•800•222•2808

Call today for your FREE Catalog!!

Fax: 310-222-5800
Customer Service: 800-560-6800
International Orders: 310-787-4500
Mail: MacMall Order Dept., 2645 Maricopa St., Torrance, CA 90503-5144

FedEx Federal Express
Priority Overnight Delivery by 10:30am! $3 Per Order†
†Limited to in-stock orders placed before 8pm (EST) not requiring configuration and delivery by FedEx delivery service to destinations within the contiguous U.S. Next day delivery may not be available in certain rural areas. Limit 10 lbs.

SyQuest®

The best in removable media

VividQuest 88MB drives provide you with unlimited storage of your data with the flexibility of a floppy disk. Once you fill up one disk, just pop in a new one and you're ready to go. Transporting documents has never been easier, just place your cartridge in any SyQuest® compatible drive and you are ready to get back to business! Archive irreplaceable files with the confidence that your data will not be compromised. VividQuest 88MB internal and external drives also read and write to 44MB cartridges.

270MB/RW105 External SyQuest® Drive
w/ cartridge and cable
$484.99 #68860

88MB/RW44 External SyQuest® Drive
(with cartridge) $349.99 #70069

200MB/RW88/44 External SyQuest® Drive
w/cartridge and cable..... $469.99 #68861
w/o cartridge ..... $389.99 #72029

270MB Cartridge ONLY! $64.99

GENUINE SyQuest® CARTRIDGES

270MB cartridge	$64.99	#64415
200MB cartridge	$79.99	#64417
105MB cartridge	$58.99	#61241
88MB cartridges	$51.99	#3304
44MB cartridges	$44.99	#1906

FREE BONUS

FWB Hard Disk Toolkit Personal Edition with purchase of external 88 MB drive

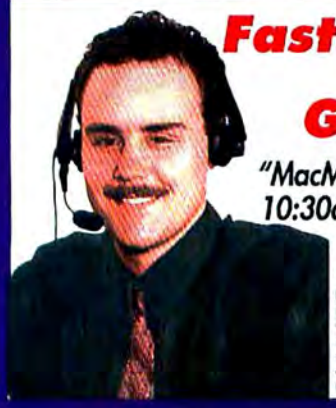
Quantum® External Hard Drives

Quantum

Quantum® external hard drives incorporate advanced technological features to significantly enhance the speed of your Macintosh® system. Achieve high speed and performance with new high speed microprocessor, a fast single-chip read channel, firmware and hardware enhancements. Accelerate the performance and throughput of your system with a Quantum® 365, 540, 730, 1080, 1400 or 2100MB drive. Increase the performance of your mid-range or high-end Macintosh® system. Reliability, performance and price so that everyone can enjoy the benefits of having a Quantum® external hard drive. Quantum® drives include everything you need to get started right away! Get the most for your money, buy a Quantum® hard drive today!

- Power Saving Modes
- AIRLOCK® automatic shipping lock
- 25-50 pin SCSI cable
- Active Terminator
- Power Cord
- Silverlining Disk Management Software
- User's Guide
- Software licensing agreement
- Read-On Arrival
- Two Year Limited Warranty
- Read/Write multiple
- WriteCache and DisCache firmware
- AutoTransfer Technology
- Defect-Free Interface® firmware
- AutoRead® and AutoWrite®
- Software licensing agreement

365MB External $299.99 #70020
540MB External $339.99 #70021
730MB External $399.99 #70022
1080MB External $679.99 #70023
1400MB External $849.99 #70024
2100MB External $1189.99 #70025



Fastest Delivery Service Guarantee

*"MacMall will deliver your order by 10:30am THE NEXT DAY or pay for your shipping"**

*Limited to in-stock orders placed before 8pm (EST) not requiring configuration and delivered by FedEx® delivery service to destinations within the contiguous U.S.. Next day not available to certain rural areas. Limit 10 lbs.

FedEx† Federal Express

MacMall has all the latest PowerMac™ Native Software!!

Accelerated for Power Macintosh

OUR POLICIES †$3.00 FEDEX® offer applies to continental U.S. only, orders over 10lbs incur extra charges. Call customer service at 800-560-6800 or tech support at 800-760-0300 if you have a question or problem with any order. No packages will be accepted with out a Return Authorization Number form Customer Service. All returned products must be in original condition with all packaging and registration card, within 30 days of original invoice date. For International orders, please include a photocopy of the front and back of your credit card. Minimum International order is $50 Canada, $100 Foreign; $20 in U.S.A. Apple and Hewlett Packard products cannot be shipped outside of the U.S.A. International orders shipped via DHL, FOB Los Angeles. Apple, the Apple logo and Macintosh are registered trademarks of Apple® Computer, Inc While we do our best to check for mistakes, occasionally they do occur. Prices and specs subject to change without notice. ©1995 MacMall

Circle 131 on reader service card

ClubMac 5.25" 88MB Removable

FEATURING SyQuest REMOVABLE TECHNOLOGY

$349

C109 1002

ClubMac 3.5" 270MB Removable

FEATURING SyQuest REMOVABLE TECHNOLOGY

$479

C109 1004

ClubMac 5.25" 200MB Removable

FEATURING SyQuest REMOVABLE TECHNOLOGY

$478

C109 1003

DON'T FORGET TO STOCK UP ON GENUINE SYQUEST CARTRIDGES

Part Number	Media	Qty 1	Qty 10	Qty 20	Part Number	Media	Qty 1	Qty 10	Qty 20
S198 1010	5.25" 44MB	$43ea	$42ea	$41ea	S198 1013	3.5" 105MB	$55ea	$53ea	$51ea
S198 1011	5.25" 88MB	$48ea	$47ea	$46ea	S198 1014	3.5" 270MB	$62ea	$61ea	$60ea
S198 1012	5.25" 200MB	$76ea	$74ea	$72ea	SyQuest Cartridges include a FIVE Year Warranty.				

Quantum

2.5" POWERBOOK DRIVES

Model	Capacity	Part No.	Internal	Part No.	External
Daytona	341MB	Q030 1041	$299	C109 1119	$419
Daytona	514MB	Q030 1002	$399	C109 1109	$519

3.5" EXNTRY LEVEL HARD DRIVES

Model		Capacity	Part No.	Internal	Part No.	External
Trailblazer	NEW	420MB	C109 1204	$209	C109 1205	$269
Lightning		540MB	C109 1150	$229	C109 1100	$289
Lightning		730MB	C109 1154	$259	C109 1102	$319

3.5" HIGH PERFORMANCE DRIVES

Model		Capacity	Part No.	Internal	Part No.	External
Fireball	NEW	540MB	C109 1200	$269	C109 1201	$329
Fireball	NEW	1080MB	C109 1202	$499	C109 1203	$559
Atlas		2100MB	C109 1112	$949	C109 1111	$1009
Atlas		4280MB	C109 1122	$1499	C109 1121	$1559

Quantum Atlas 2100MB

$949

C109 1112
Internal

Quantum Fireball 1080MB

- Improved performance
- Data transfer rates up to 16.6 MB/sec
- 12ms average seek time
- 5,400 RPM rotational speed
- 128KB buffer size
- 500,000 hours MTBF

$499

C109 1200
Internal

EPSON Stylus COLOR Inkjet Printer

Now you can print in vivid color with clarity never before possible in a personal color printer. At 360 dpi resolution blacks are blacker and at 720/360 dpi the color output is the sharpest available.

- Incredible 720 dpi color printing, optimized with special coated paper
- 360 dpi black print resolution
- Prints up to 16 million colors
- Includes Serial interface, Mac driver software and a TWO Year Warranty

$529

E047 1012

May 1995

IntelliColor Display/20e

The Radius IntelliColor Display/20e is part of the next generation in professional two-page color displays. It delivers unrivaled command of your desktop, from on-the-fly resolution switching to state-of-the-art color temperature control. Combined with Radius' IntelliColor software, it allows you to emulate 3 lighting conditions and user-adjustable color temperature, so you get more accurate color representation. (F016 1007)

F016 1013	PressView 21T Display System	$3129
F016 1016	SuperMatch 21•T XL	$2139
F016 1009	IntelliColor Display/20e	$1949
F016 1031	PressView 17•SE Display System	$1869
F016 1007	PrecisionColor Display/17	$989
F016 1007	PrecisionView 17	$925

VideoVision Studio 2.0

With JPEG hardware compression and decompression for full-screen, full-motion recording and playback from a hard disk, VideoVision Studio combines the power and flexibility of the Macintosh with the ease and transportability of video tape.

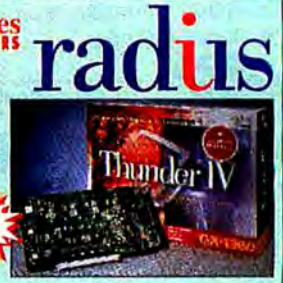
$3649

R013 1018	VideoVision Studio 2.0	$3699
R013 1020	VideoVision Studio 2.0 Upgrade	$1759
R013 1026	Spigot Power AV	$759
R013 1065	Spigot Pro AV	$1249

Thunder Series GRAPHIC ACCELERATORS

radius

Three Thunder IV GX cards extend the 24-bit resolution of the PowerMac's built-in video. Accelerated 24-bit color, built-in Photoshop acceleration, CMYK acceleration, hot-key resolution switching, pan and zoom, color composer and 10-bit DAC add up to make these cards the number one choice for image processing, compositing and illustration.



as low as **$1829**

Adobe Photoshop

R013 1051	Thunder IV GX•1152 24-bit support 1152 x 870	$1829
R013 1048	Thunder IV GX•1360 24-bit support to 1360 x 1024	$2289
R013 1055	Thunder IV GX•1600 24-bit support to 1600 x 1200	$2799
R013 1062	Thunder/24 GT 24-bit support to 1152 x 870, PhotoEngine optional	$1329

Scanners

EPSON

Epson ES-1200 Pro Mac Scanning System

HIGH DETAIL 4800 DPI, 30-BIT COLOR SCANNING MADE AFFORDABLE.

- 600 x 1200 dpi scanning resolution (up to 4800 dpi via interpolation)
- Epson's TrueColor scanning technology
- Scans over ONE BILLION colors
- 8.5" x 11.67" scanning area
- Built-in image processing features
- Increased image quality with 30-bit color scanning

2 YEAR WARRANTY

E045 1003	Epson ES-1200C Pro-MAC	$1269
E045 1004	Transparency Unit	$749
E045 1008	Automatic Document Feeder	$465

$1269

E045 1003

NEC

3 YEAR WARRANTY

VALUE SERIES

N026 1023	14" MultiSync XV14	$319
N026 1015	15" MultiSync XV15	$429
N026 1022	17" MultiSync XV17	$759

ENTERPRISE SERIES

N026 1036	15" MultiSync XE15	$549
N026 1037	17" MultiSync XE17	$999
N026 1010	21" MultiSync XE21	$1989

PROFESSIONAL SERIES

N026 1005	15" MultiSync XP15	$599
N026 1009	17" MultiSync XP17	$1229
N026 1011	21" MultiSync XP21	$2439

Perfect solution for home, small office and corporate users large screen performance at an affordable price.

- 17" Flat Square Technology
- 15.6" viewable image size
- Mac Res: 1024 x 768 NI PC Res: 1280 x 1024 NI
- 0.28mm dot pitch
- FullScan capability
- OnScreen Manager

17" MultiSync XV17

$759

N026 1022

Modems

SupraFAXModem

S140 1006	Supra Express 14.4 Plus	$99
S140 1007	SupraFAXModem 28.8 MC V. 34	$225
S140 1008	SupraFAXModem 28.8 PB V.Fast Class for PowerBooks	$299

Supra Modems include a FIVE Year Warranty.

28.8 MC v.34

Acceleration

DAYSTAR DIGITAL

100 MHz Turbo 601

UP TO 100MHz

$1689

IN STOCK!

BEST BUY

66 MHz PowerCard 601

$639

D040 1040

Compatible with Performa, Quadra and LC 47x, 57x, 62x, 63x

DayStar 66 MHz Turbo 601	Compatible with Mac IIci (D040 1039), IIsi (D040 1049), IIvx/vi/Performa 600 (D040 1051)	$989
DayStar 100 MHz Turbo 601	Compatible with Mac IIci (D040 1046), IIsi (D040 1050), IIvx/vi/Performa 600 (D040 1052)	$1689
D040 1040	66 MHz PowerCard 601	$639
D040 1018	Turbo '040 40MHz with 128K Cache	$769
D040 1043	100 MHz PowerPro 601	$1689

GLOBAL VILLAGE COMMUNICATION

NEW PRODUCT

TELEPORT PLATNUM

Easy-to-use Fax/Modem Features

- Fax/Voice Discrimination
- 14.4bps Send/Receive Fax
- 28.8 bps data communication
- Award-winning GlobalFax 2.5 Software
- FIVE Year Warranty

PowerPort INTERNAL

G050 1001	Mercury/PB Duos	$325
G050 1002	Mercury/PB 500s	$325
G050 1003	Mercury/PB 100s	$325
G050 1017	Platinum/PB 100s	$345

eleport EXTERNAL

G050 1006	Gold II	$139
G050 1016	Platinum	$229

US Robotics

The Intelligent Choice in Data Communications

SPORTSTER 28.8 MAC&FAX

U020 1003	Sportster 14.4 Mac&Fax	$129
U020 1007	Sportster 28.8 Mac&Fax V. 34 and V. Fast Class	$249

CALL NOW FOR FREE NEW CATALOG

NO SURCHARGE!

Source Code 69795

ClubMac®

1-800-258-2622

Info, Sales (714)768-8130 • Tech Support (714)768-1490
24 Hour Fax (714)768-9354 • 7 Hammond, Irvine, CA 92718

WARRANTIES: All items manufactured by ClubMac are returned to ClubMac for warranty repair. All other items carry manufacturer's warranty. MONEY BACK GUARANTEE: All products manufactured by ClubMac carry a 30 day money back guarantee. ClubMac extends all other manufacturers' return policies to its customers. Non-ClubMac products carry 30 day money back guarantee when specified. RETURNS: Call for RMA number! Any product that is returned WITHOUT an RMA number will be refused. ALL PRODUCT INFORMATION AND PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE. NOT RESPONSIBLE FOR TYPOGRAPHICAL ERRORS.

1-800-258-2622 1-800-CLUBMAC 1-800-258-2622

Circle 96 on reader service card

MacProducts USA.

Optical Blow Out! Your best storage value. Dollar for dollar. Megabyte for megabyte.

Magic Optical

Magic 230MO $399†

†with the purchase of 10 230mb carts

3.5" format. 28 ms access time. 1.7 MB/sec. 1 year warranty.

230 Optical Cartridge	$29
128 Optical Cartridge	$24

Best Value

	Drive Cost	Media Cost (10 pack)	Cost per MB
230 MB Optical	**$399**	**$290**	**29¢**
Zip Drive	$199	$149	34¢
SyQuest 270	$399	$630	38¢
SyQuest 200	$419	$790	60¢
1GB Hard Drive	$699	-	69¢
SyQuest 88	$359	$470	94¢
SyQuest 44*	$199	$430	$1.46

* Discontinued products. Cost per megabyte is figured from drive cost plus ten cartridges.

The optical advantage.

MacProducts USA Optical drives provide your most effective cost per megabyte of any proven storage medium. And now, with our new lower price, that cost advantage is stronger than ever. Plus, unlike other removable media types, optical media is heat resistant, shock resistant and has up to 500% longer shelf life. The small form factor makes storage and transport easy.

$399. Prices have never been better!

MacProducts USA
1-800-347-1942

Major credit cards and institutional PO's accepted. Prices subject to change without notice. Call customer service at 512-892-4090 for returns. Returns may be subject to a restocking fee.

512-892-4070 Fax. 512-892-4455
Internet: sales@dgr.com http://www.dgr.com/
4544 S. Lamar Blvd., Suite 100, Austin, Texas 78745

Take your Power Mac to the limit. $119.

PowerClock accelerates your Power Mac up to 40%. Total compatibility. Now includes software FPU, 30 Day MBG, 3 Year Warranty. Toll-free technical support.
PowerClock Pro 8100 126 Mhz $169

POWER CLOCK

PowerMac ACCELERATOR

Dealer pricing available.

1-800-347-1942

Internet: http://www.dgr.com/

Major credit cards and institutional PO's accepted. Prices subject to change without notice. Returns may be subject to restocking fee.

512-892-4070 Fax. 512-892-4455 Internet: sales@dgr.com
4544 S. Lamar Blvd., Suite 100, Austin, Texas 78745

Circle 65 on reader service card

DIRECT CONNECTIONS

800-572-4305

30 DAY MONEY-BACK

INT'L:612-937-9604
FAX:612-937-6285
HOURS: M-F 8:00-6PM CST

SHIPPING DRIVES FOR 8 YEARS !!

Compare the components we use to any competitor and you'll see our quality is better. We use only the best enclosures and cables. Guaranteed.

VISA MasterCard DISCOVER NOVUS

HARD DRIVES
Conner 1.2gig $455.

FUJITSU
2 YEAR WARRANTY

CAPACITY	SIZE	ACCESS	RPM	INTERNAL	EXTERNAL
530MB	3.5"	13MS	5400	$ 279	$ 339

Seagate
5 YEAR WARRANTY

CAPACITY	SIZE	ACCESS	RPM	MODEL	EXTERNAL
1.2GIG	3.5"	9MS	5400	ST31230N	$ 645
2.5GIG	3.5"	8MS	7200	Barracuda 2 LP	$ 1115
2.5GIG	3.5"	8MS	7200	Barracuda 2 WIDE	$ 1199
2.4GIG	3.5"	9MS	7200	ST12450W Dual Head	$ 1555
4.1GIG	3.5"	8MS	7200	Barracuda 4	$ 1559
4.1GIG	3.5"	8MS	7200	Barracuda 4 wide	$ 1655
9.0GIG	5.25"	11MS	5400	Elite 9	$ 3095

CONNER
5 YEAR WARRANTY

CAPACITY	SIZE	ACCESS	RPM	MODEL	EXTERNAL
1.2GIG	3.5"	9MS	5400	CFP1080S	$ 515
2.1GIG	3.5"	9MS	5400	CFP2105S	$ 915
2.1GIG	3.5"	8MS	7200	CFP2107S	$ 1015
4.2GIG	3.5"	9MS	7200	CFP4207S	$ 1475

Quantum
5 YEAR WARRANTY

CAPACITY	SIZE	ACCESS	RPM	MODEL	EXTERNAL
2.1GIG	3.5"	9.5MS	7200	XP32150S LP	$ 999
4.3GIG	3.5"	9MS	7200	XP34280S	$ 1855

HITACHI

CAPACITY	SIZE	ACCESS	RPM	INTERNAL	EXTERNAL
1.0	3.5"	9MS	6300	$ 585	$ 645

POWERBOOK-CORNER

240MB	14MS internal	$315
340MB	14MS internal	$385
514MB	14MS internal	$445
Datasonix Mobile Storage		$649

SyQuest®

88MB	SQ5110C	$365
200MB	SQ5200	$485
270MB	SQ3270	$485

MONITORS

ys are both PC and Mac compatible

ny	GDM-15SF1 15"	$435
ny	CPD-17SF1 17"	$889
ny	GDM-20SE1 20"	$1899

CD RECORDERS

Yamaha 4 speed recorder
$ 3395

"We recommend the Yamaha CDE 100"
-MacWorld Mar. '95

SCANNERS

MUSTEK 1200dpi Color (2400 with interpolation) including transparency unit and software. Everything included for Mac, Dos,Windows $889

MUSTEK 600dpi Color 8.5"x14" $469

OPTICAL DRIVES
230 MB EXTERNAL $575

INCLUDES ONE CARTRIDGE
1 YEAR WARRANTY

The new Sony 1.3GB half-height has 4MB of cache and 3600rmp making this the fastest Optical drive in the market today! Call for comparisons against the competition.

Sony's latest technology

CAPACITY	MODEL	EXTERNAL
230MB	Fujitsu	$ 575
1.3GB	NEC	$ 1599
1.3GB	Sony 4MB Cache	$ 1949
1.3GB	Ricoh Turbo	$ 2175
26GB	Sony Juxebox	$ 6395

TAPE BACK-UP

With 2.5mb/sec sustained transfer, the DLT2000 is perfect for digital video or prepress with large data files.

2 Year Warranty

INCLUDES TAPE + RETROSPECT SOFTWARE

CAPACITY	MODEL	MEDIA	INTERNAL	EXTERNAL
1.3-2GIG	DC DAT	4MM	$ 709	$ 769
1.3-4GIG	DC DOUBLE DAT	4MM	$ 839	$ 899
4.0-8GIG	Connor 4326 DDS-2	4MM	$ 1089	$ 1149
4.0GIG	Sony 5200 DDS-2	4MM	$ 939	$ 999
4.0-8GIG	Sony 5000 DDS-2	4MM	$ 969	$ 1029
7.0-14GIG	Exabyte 8505XL	8MM	$ 2185	$ 2245
10-20GIG	Quantum DLT (DIGITAL LINEAR) INCREDIBLE 2.5MB/SEC TRAMSFER RATE	1/2	$ 3575	$ 3675
-140GIG	Exabyte-10h Library	8MM		$ 4999

Our Top rated RAID Systems include a Nubus accelerator card, Remus RAID software, and all cabling and termination.

RAID SYSTEMS
From 1 to 84 GIG

"Stick with a vendor such as Direct Connections that understands how to prepare a RAID for desktop video." MacWorld April '95

- 2.0GIG RAID Level 0. Perfect for highspeed requirements. $ 2199
- This Array is the one to beat!! 4.0 GIG Barracuda 2 Wide RAID. $ 3599
- 6.0 GIG Fast and Wide. Fastest RAID for Video Vision Users. $ 4799

VideoVision Studio $ 3649

Full screen and full motion recording and playback with JPEG hardware compression and decompression.

radius

MEDIA

128MB	Optical	$ 25	90M Tape		$ 10
230MB	Optical	$ 29	112M Tape		$ 15
650GIG	Optical	$ 79	120M Tape		$ 18
1.3GIG	Optical	$ 99	CD ROM 10 Pack		$ 99
SYQUEST 44MB		$ 42	SYQUEST 88MB		$ 48
SYQUEST 200MB		$ 76	SYQUEST 270MB		$ 61

DIRECT CONNECTIONS 7668 Executive Drive Eden Prairie, MN 55344 * 1 YR WARRANTY. ** 2 YR WARRANTY. Gov't, Corp, and Univ. P.O's accepted. 30 day money back does not apply towards monitors.

Circle 121 on reader service card

All Prices 5% Above Cost!

FREE Cellular Phone
*with ANY CPU purchase**

BUSINESS LEASING
Warrantied/Updated technology at your fingertips

BECAUSE 80% OF AMERICAN COMPANIES LEASE, DIGICORE HAS CREATED THE ULTIMATE LEASE PLAN, ADMINISTERED BY TRANSLEASING CORPORATION

- Any established business can lease
- Purchase options are available
- Warrantied equipment for lease term
- Quick approvals & deliveries
- Flexible terms • No Down Payment
- Low fixed monthly payment
- Aggressive pricing

Small Business Station

Lease $108 36 mo

PowerMac 6100/66, 8-350 w/CD
15" Multiscan Display
Extended Keyboard
SyQuest 200, external

CyberMac 81 Workstation
PowerMac 8100/100AV, 16-1000 CD
20" Multiscan Display
Thunder IV/GX 1152

Lease $310 36 mo

Extended Design Keyboard
SyQuest 270, external

The Enterprise 7101
PowerMac 7100/80, 16-700 w/CD
17" Multiscan Display
Ext.Design Keyboard
SyQuest 270, external

Lease $179 36 mo

Demon Workstation 8110

PowerMac 8100/110, 16-2000 CD
21" Multiscan Display
Thunder IV/GX 1600
VideoVision 2 Pro Pak
w/4.2 GB Array
Premiere 4 & VideoFusion
Ext KB, Apple Design Speakers

Lease $475 60 mo

* Activation required. Phones vary with rate plan. Phone certificates are transferable and valid for 6 mos. Allow 2-3 weeks for delivery. Certain restrictions may apply. Void where prohibited by law.

PowerMac

		Lease
6100/66, 8-350	1547	56
6100/66, 8-350 w/CD	1727	65
6100/66AV, 8-350 w/CD	2127	79
6100/66, 16-500 w/DOS	2477	89
7100/66, 8-500 w/CD	2197	82
7100/80, 8-500	2457	89
7100/80, 8-700 w/CD	2747	99
7100/80AV, 16-700 CD	3297	113
8100, 8-500	2695	94
8100, 16-500 w/CD	3195	109
8100/100, 8-700	3097	105
8100/100, 16-1GB w/CD	3877	131
8100/100AV, 16-1GB CD	4057	139
8100/110, 16-2GB w/CD	5397	185
WGServer6150, 16-700 w/CD & Internet Srvr for WWW	2769	97
WGServer8150, 16-1000 w/CD, & Internet Srvr for WWW	4577	159
WGServer95, 16-230	2949	106
Performa 6115CD	2277	86
Performa 630, 8-250 CD	1347	55

Monitors

		Lease
Apple 20" Multiple Scan	1849	67
Apple 17" Multiple Scan	889	32
Apple 15" Multiple Scan	449	14
Apple 14" Color Plus	295	--
Supermac 21•TXL	1995	73
Supermac Pressview 21 T	2699	105
Radius IntelliColor/20e	1877	64
Radius PrecisionColor 17	939	36

Sony 20SE1 w/adapter	1869	69
Sony 17SF1 w/adapter	909	34
Sony 15" SF w/adapter	477	19
Sony 1425S, 14" Trinitron	339	17

Video Boards

		Lease
Thunder IV/GX1600	2569	93
Thunder IV/GX1360	1999	73
Thunder IV/GX1152	1829	66
Radius P'Color Pro 24X	619	28
Radius P'Color 24XK	449	15
Radius P'Color 24XP	239	15
Radius Thunder 24GT	1269	48
Radius VIDEO VISION v2 w/Premiere v4 & VideoFusion	3350	119
Supermac GX1600	1969	72
Supermac GX1360	1499	53

Powerbooks

		Lease
150, 4-120	997	47
520, 4-160	1559	57

GCC WriteMove II only 2.5 lb. $129*

520c, 4-160	1837	66
520c, 12-160 w/modem	2527	86
540c, 4-320	2787	105
540c, 12-500 w/modem	3697	127
280, 4-240	1950	70
280, 12-240 w/modem	2550	91
280c, 4-320	2987	106
280c, 12-320 w/modem	3499	124

Printers

GCC WriteMove II	129	--

(with any Powerbook purchase)
360x360 dpi, Laser-quality, ATM included, on-screen page preview

Specials on all GCC Printers

		Lease
GCC SelectPress 1200	4269	149
GCC Elite XL1208	4269	123
GCC Elite XL616	2599	98
GCC ColorFast II	4099	117
(33-bit color digital film recorder)		
GCC Elite XL808	2729	99
GCC Elite XL608	2199	83
StyleWriter II	169	--
Color StyleWriter 2400	589	18
HP 4MV	2699	87
HP 5MP	1049	42
LaserWriter 16/600	1995	69
LaserWriter Select 360	1299	39

Portable Color Printer $199

Scanners

		Lease
Agfa StudioScan II	899	33
Agfa Arcus II w/transp.	2599	94
HP ScanJet IIIcx	939	34
UMAX Vista S6 Pro	739	28
UMAX Vista S8 Pro	869	31
UMAX 1260 Pro	919	35
UMAX Powerlook	2529	91
Microtek Scanmaker III	2675	88
Microtek IIHR	999	37

CD-ROMs

Arts

34.95	Macbeth
59.95	American Visions
39.95	Prince Interactive
22.95	The Orchestra
34.95	Freak Show
98.95	Rosetta Stone PowerPac
34.95	Salt of the Earth
19.95	A Hard Day's Night
29.95	Mozart
31.95	The Complete Maus

Biz

139.95	PhoneDisc Powerfinder
16.95	Take Five
9.95	Great Business Jokes
499.95	AccuZip6
74.95	Street Atlas USA

Kids

39.95	Mario Is Missing!
9.95	Word Tales
19.95	Peter and the Wolf
29.95	DinoSource
34.95	Comic Book Confidential
29.95	Parenting

Life

22.95	The Animals
44.95	The Rainforest
34.95	OceanLife Vol.4: Great Barrier Reef
34.95	OceanLife Vol.3: Hawaiian Islands
29.95	Audubon's Birds
29.95	Audubon's Mammals
19.95	Oceans Below
34.95	Whales & Dolphins

Play (Games)

49.95	Myst
59.95	Cosmology of Kyoto
55.95	Star Trek 25th Anniversary
34.95	Baseball's Greatest Hits
59.95	Gadget
44.95	Indiana Jones—Fate of Atlantis
29.95	The Chessmaster 3000
45.95	The 7th Guest
65.95	The 11th Hour
34.95	C.H.A.O.S. Continuum
9.95	Funny

Reference

49.95	Grolier's Encyclopedia v6.0
19.95	The View From Earth
39.95	Mayo Clinic—Family Health
39.95	Mayo Clinic—The Total Heart
9.95	Macintosh Product Registry
39.95	Exploring Ancient Cities
55.95	Compton's '95
22.95	World Atlas
22.95	US Atlas
19.95	Capitol Hill
19.95	Space Shuttle
22.95	Desert Storm
39.95	The First Emperor of China
34.95	Who Built America?

Drives

Pinnacle RCD 1000	1649
HHB 680 MB blank CDR *(Life Span: 100+ years)*	10.99
Pinnacle Tahoe 230	999
SyQuest 200c w/cart	577
Radius 4 GB Pro Array	5400
1 GB Conner1080	425
2.1 GB Quantum	899
2.4 GB Seagate Barracuda	1195
4 GB Seagate Barracuda4	1495
FWB HammerDAT2000	1297
FWB HammerDAT5000	1389

Arrays from FWB

SledgeHammer4100 Wide	3729
SledgeHammer8200 Wide	5169
SledgeHammer17400 W	8399
SCSI JackHammer	599

DigiCore

Over 2600 Apple products to choose from — call for unlisted products
All Major Credit Cards Accepted — CODs Available

Due to publication time constraints prices may vary • All Prices Reflect CASH DISCOUNT • No Sales Tax EXCEPT in CA • Live Operator on duty • Hours: Mon-Fri, 7am to 7pm, 24 hr FAX LINE • FREE Subscription to DigiCore Catalog, no purchase necessary • Non-Defective Returns or Shipped Orders may be subject to Restocking Fee • Shipping and service fees are non-refundable • Lease prices are approximate based on 36 months (on approved credit) • All products carry a 1 yr minimum manufacturer's warranty on parts and labor unless otherwise specified •

Order Toll-Free
800-858-4622
ph 818-785-2800
fx 818-785-3100

DigiCore Inc
15500 erwin st #2002
van nuys ca 91411

Circle 269 on reader service card

Save Your Work (And Your Money) On Spin Cartridges!

Introducing the tough, inexpensive SyQuest™ compatible cartridge from Spin.

Now there is a new, less expensive choice in removable media. Constructed of the strongest, most advanced materials available, Spin cartridges deliver unsurpassed reliability. Manufactured under license from SyQuest Technologies, each cartridge is completely compatible with your 44MB, 88MB, and 200MB 5.25" removable drives. To further insure your satisfaction, we offer the protection of a 30-day money back guarantee, an unconditional 6-year warranty, and toll-free technical support. Both the 44MB and 88MB cartridges are in stock and ready to ship overnight.

> "All the cartridges are equally tough... When deciding among cartridges based on different technologies, examine your budget."
> - MacUser July, 1994

BERNOULLI

DAT

OPTICAL

SYQUEST

SPIN CARTRIDGES OFFER YOU:

- ✓ Unsurpassed Reliability
- ✓ Full 6-Year Warranty
- ✓ Immediate Availability
- ✓ Overnight Delivery

✈ $5.00 OVERNIGHT SHIPPING ✈
FOR ANY ORDER UP TO 5 POUNDS!

Spin will ship any order to you overnight for just $1.00 per pound, with a $5.00 minimum. If your order is over 21 pounds your price per pound goes down.

- ✓ Toll-Free Tech Support
- ✓ 30-Day Money-Back Guarantee

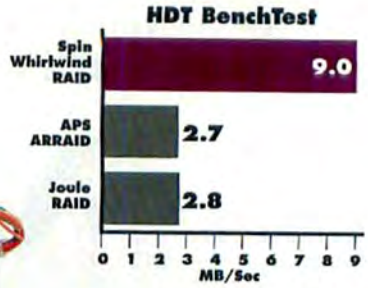
FAX: 1-508-787-1201
TEL: 1-508-787-1200
Spin hours: 8:30am to 8pm EST, Monday-Friday

VISA MasterCard AMERICAN EXPRESS DISCOVER TeleCheck

Spin PERIPHERALS
734 Forest Street, Marlborough, MA 01752
spin@world.std.com

ORDER DIRECT: 1-800-215-9200

Whirlwinds are the optimum video professional storage solution.



Internal RAID

Our internal kit offers all of the advantages of RAID and can be conveniently mounted in the extra drive bay of your 800, 840AV, PowerMac 8100, or Workgroup Servers 80 and 8150. Dual fans keep the drives and your Mac cool. Internal arrays can be expanded with Whirlwind Fast & Wide drives through the Silicon Express IV external port.

CAPACITY	RAID 0,1	RAID 0,1,4,5
2GB	$2999	$3199
4GB	$3799	$3999

SyQuest Drives

Spin SyQuest™ 3.5" and 5.25" removable drives accommodate your expanding storage needs without slowing you down. The new 200MB and 270MB continue the SyQuest reputation for convenience and reliability at higher speed and capacity. Small, lightweight cartridges are easy to transport and store.

SyQuest 44MB		Cartridge	$43
SyQuest 44/88MB	$299	Cartridge	$48
SyQuest 200MB	$409	Cartridge	$75
SyQuest 105MB	$199	Cartridge	$56
SyQuest 270MB	$429	Cartridge	$65

MacUser 4½ mice rating for our SyQuest 200 and 270!

DAT Drives

Before disaster strikes, secure your valuable data with a Spin DAT drive. The low cost 3100 stores 2GB while the 3400 packs up to 8GB for remote backups and large audio, video and graphics files. All DAT drives include one tape cartridge and Retrospect™ for easy, complete backups.

Spin 3100 (DDS)	$799
Spin 3200 (DDS-DC)	$899
Spin 3400 (DDS-2)	$999

Whirlwind RAID

Whirlwind RAID is fast enough to handle all types of applications, even high-quality 30 fps video. In benchmark tests, our Fast & Wide arrays approach transfer rates of 9 megabytes per second, and will deliver better than 5.5 MB/sec performance when used with Radius VideoVision Studio™. Package includes ATTO SE IV, Remus software RAID controller, active terminator.

CAPACITY	RAID 0,1	RAID 0,1,4,5
2GB	$2999	$3199
4GB	$3799	$3999
8GB	$5399	$5599

QuickTape

Our new tape drive is the affordable backup storage solution. Easy to use and highly reliable, the Spin QuickTape will secure your valuable data faster than a 2GB DAT drive. Based on the new Tandberg mechanism, the drive can use 1GB QIC-Wide cartridges. Delivered with Cheyenne five-user backup software package and one cartridge.

QuickTape	$499	Cartridge	$19

Optical Drives

Spin's 3.5" Olympus 230MB is the affordable solution to securing your data while the 5.25" Maxoptix 1.3GB optical drives set the standard for speed and capacity. Great for backups, archiving, and as a secondary drive. One cartridge included.

Olympus 230MB	$599	Cartridge	$39
Maxoptix T4 1.3GB	$1999	Cartridge	$85

$379!
Including Cartridge!

Bernoulli Drives

Continuing the Bernoulli tradition of rugged dependability, the Spin 230MB cartridge drive provides unlimited capacity with additional cartridges. Featuring DCR Active Termination and a one year warranty, the 230MB drive is backwards compatible with older cartridges. One cartridge included.

Bernoulli 230MB	$379	Cartridge	$89
		3-Pack	$199

✈ $5⁰⁰ OVERNIGHT SHIPPING FOR ANY ORDER UP TO 5 LBS! ✈

Spin will ship any order to you overnight for just $1.00 per pound, with a $5.00 minimum. If your order is over 21 pounds your price per pound goes down.

ORDER DIRECT: 1-800-215-9200

230 MO for just $599!

Two Cartridges Included!

Features ARCserve for Macintosh from CHEYENNE

230 Magneto-Optical

Featuring Cheyenne's ARCserve five-user backup software and two cartridges, the 3.5" Spin Olympus 230 Magneto-Optical is the premium solution for securing your data. Backup or archive your valuable Photoshop™, Quark XPress™, Excel™, Word™ and database files for years.

Olympus 230 $599 Cartridge $39

Including the Anubis Formatting utility by CharisMac Engineering, Inc.

Whirlwind

These Fast & Wide drives great for applications that require high speed storage, but not an array. Used with an ATTO Silicon Express IV, a Photoshop™ file rotates 65% faster than with a standard drive. The Whirlwind drives can also be added to our Fast & Wide arrays.

1GB Seagate Barracuda	$999
2GB Seagate Barracuda	$1399
4GB Quantum Atlas	$2199
ATTO SE IV with drive purchase	$895

PowerBook Drives

Spin 2.5" drives are fast, easy to install, and offer the capacity you need when you are on the road.

Quantum 170MB	$229
Quantum 256MB	$249
Quantum 341MB	$349
Quantum 514MB	$449

Hard Drives

Our exclusive Tornado drives feature DCR Active Termination, a front mounted power switch, and interlocking feet for stable stacking. The easy-to-install Internal drives will have you up and ready in minutes.

CAPACITY	INTERNAL	TORNADO
Q Maverick 540MB	$159	$259
Q Empire 1.0GB	$599	$699
Q Capella 1.0GB	$499	$599
Spin 1.0GB	$479	$579

High-Capacity, Low-Cost, Limited Time!

CAPACITY	INTERNAL	TORNADO
Seagate Hawk LP 2GB	$849	$949
Quantum Capella 2GB	$849	$949
Quantum Grand Prix 2GB	$899	$999
Quantum Grand Prix 4GB	$1399	$1499
Quantum Atlas 2GB	$999	$1099
Quantum Atlas 4GB	$1499	$1599

Limited Time Offer. Call Now!

The best products. Reasonable overnight shipping. Overall value. So go ahead, take a Spin and enjoy.

✔ Toll-Free Tech Support
✔ 30-Day Money-Back Guarantee

FAX: 1-508-787-1201
TEL: 1-508-787-1200
Spin hours: 8:30am to 8pm EST, Monday-Friday

VISA MasterCard AMERICAN EXPRESS DISCOVER TeleCheck

Spin PERIPHERALS

734 Forest Street, Marlborough, MA 01752
spin@world.std.com

Circle 248 on reader service card

ORDER DIRECT: 1-800-215-9200

MEGAHAUS 1-800-786-1184

- Low price guarantee!
- Selling quality drives at incredibly low prices Since 1987.
- 30 Day money back guarantee.
- Fast service. Most orders shipped same day!
- Lifetime technical support.
- 24 Hour turnaround, 1 year replacement policy.
- Friendly, helpful staff. We appreciate your business!

OPTICAL DRIVES

230MB FUJITSU
- Read and write 128 or 230MB disks

External only $599 1 free disk
DynaMO external $649 1 free disk

1.3 Gig NEC
- Read and write 650MB or 1.3Gig disks
- 2 Year warranty! 1MB data buffer.

External only $1599 1 free disk

1.3 Gig Maxoptix
- Read and write 650MB, 1Gig or 1.3Gig disks
- 4MB data Buffer. 1 year warranty.

External only $2269 1 free disk

MICROPOLIS
- NEW LOW PRICE on MicroDisk external stackable disk drives! Available now for only $120 more than internal!
- WIDE SCSI A/V Drives now available.

RAIDTEC DISK ARRAYS
- RaidTec SCSI to SCSI arrays are much faster than software driven RAIDs! No CPU time is required to implement the RAID.
- Call for specs & a custom configuration quote.

ATTO SCSI ACCELERATOR

Nubus cards, get the full speed from your drives.

SAVE $20 with hard drive sale!	Alone
SiliconExpress II FAST SCSI	$499
SiliconExpress IV WIDE SCSI	$859

CD ROM RECORDER $1799

Smart and Friendly CD-R 1002
Double Speed, Multi Session, 1MB buffer
Includes Gear CD Authoring Software for Mac
Media CDR63 or 74 Qty 50 $8.50ea. Qty 100 $8ea.

2.5" Powerbook Drives

Size	Speed	RPM	Brand	Price
240MB	14ms	4500	Fujitsu	$245
256MB	17ms	4500	Quantum	$255
514MB	17ms	4500	Quantum	$425

FUJITSU

BEST BUY!

FUJITSU OFFERS THE BEST VALUE ON THE MARKET!
- Low price guarantee on all Fujitsu drives!

Capacity	Speed	RPM	Buffer	Wty	Model	Internal	External
530MB	13.8ms	4500	256K	2yr	M2684S	$209	$269
1080MB	9.5ms	5400	256K	5yr	M1606S	$489	$549
2100MB	9.5MS	7200	512K	5yr	M2915S	$899	$959

Quantum™

#1 HARD DRIVE FOR MAC!

MegaHaus is your #1 source for Quantum drives.
- Low price guarantee on all Quantum drives!
- Same day shipping on most orders!

Capacity	Speed	RPM	Buffer	Wty	Model	Internal	External
420MB	14ms	4500	128K	3yr	TB420S	$Call	$Call
541MB	11ms	4500	128K	2yr	LT540S	$239	$299
731MB	11ms	4500	128K	2yr	LT730S	$265	$325 BEST BUY!
850MB	14ms	4500	128K	3yr	TB850S	$Call	$Call
1080MB	12ms	5400	128K	3yr	FB1080S	$529	$589
1080MB	9.5ms	5400	512K	5yr	IMP1080S	$559	$619
2140MB	8ms	7200	1024K	5yr	XP32150	$929	$989
2160MB	9.5ms	5400	512K	5yr	EMP2160S	$909	$969
4280MB	8ms	7200	1024K	5yr	XP34300	$1529	$1589

SyQuest®

MegaHaus is your #1 source for Syquest drives.
- Low price guarantee on all Syquest drives!
- 1 FREE cartridge with each drive!
- 2 year warranty on drive and case!
- 5 year warranty on all cartridges!
- Same day shipping on most orders!

Genuine Syquest cartridges Qty 4-9 / 10+ or with drive.		
44MB	$42	$40
88MB	$47	$45
105MB	$53	$50
200MB	$76	$71
270MB	$59	$56

Capacity	Speed	Compatible	Model	Buffer	Internal	External
88MB	20ms	44, 88MB	SQ5110C	32K	$285	$345
105MB	14.5ms	105MB	SQ3105S	64K	$260	$320
200MB	18ms	44,88,200MB	SQ5200C	64K	$419	$475
270MB	13.5ms	105, 270MB	SQ3270S	128K	$409	$465

Brand	Capacity	Speed	RPM	Buffer	Wty	Model	Internal	External
Seagate	1050MB	9ms	5411	512K	5yr	ST31230N	$519	$579
NEC	1083MB	11ms	4090	256K	3yr	D3827	$399	$459 BEST BUY!
Conner	1080MB	9ms	5400	256K	5yr	CFP1080S	$479	$539
Micropolis	2050MB	8.5ms	7200	512K	5yr	MC4221	$949	$1009
Micropolis	2050MB	A/V Gold	7200	512K	5yr	MC4221AV	$999	$1059
Micropolis	2050MB	WIDE SCSI	7200	512K	5yr	MC4221W	$1059	$1199
Conner	2147MB	9ms	5400	512K	5yr	CFP2105S	$889	$949
Conner	2147MB	9ms	7200	512K	5yr	CFP2107S	$999	$1059
Seagate	2147MB	9ms	5411	512K	5yr	ST32430N	$889	$949
Seagate	2147MB	8ms	7200	512K	5yr	ST32550N	$989	$1049
Seagate	2147MB	WIDE SCSI	7200	512K	5yr	ST32550W	$1159	$1299
Seagate	4290MB	9ms	5400	512K	5yr	ST15230N	$1329	$1389
Seagate	4290MB	8ms	7200	1024K	5yr	ST15150N	$1500	$1560
Seagate	4290MB	WIDE SCSI	7200	1024K	5yr	ST15150W	$1659	$1799
Micropolis	4294MB	8ms	7200	512K	5yr	MC3243	$1329	$1389 BEST BUY!
Micropolis	4294MB	A/V Gold	7200	512K	5yr	MC3243AV	$1419	$1479
Micropolis	4294MB	WIDE SCSI	7200	512K	5yr	MC3243W	$1459	$1599
Conner	4294MB	9.5ms	7200	512K	5yr	CFP4207S	$1489	$1549
Micropolis	9100MB	12ms	5400	512K	5yr	MC1991	$2139	$2239
Micropolis	9100MB	A/V Gold	5400	512K	5yr	MC1991AV	$2249	$2349
Micropolis	9100MB	WIDE SCSI	5400	512K	5yr	MC1991W	$2299	$2499
Seagate	9090MB	11ms	5400	1024K	5yr	ST410800N	$3049	$3149

CD ROM DRIVES

Brand	Model	Speed	Transfer	Buffer	Internal	External
Sanyo	SH254S	190ms	600KB/sec	256K	$229	$279
Toshiba	XM3601	155ms	660KB/sec	256K	$329	$379
Plextor	6Plex	145ms	900KB/sec	256K	$559	$609

We also stock Pioneer disk changers, Sony , and NEC drives.

MEGAHAUS HARD DRIVES

M-F 8-8 Sat 9-3 Central
Local (713) 534-2630
Fax (713) 534-6580
TTY (Deaf Line) 1-800-473-0972
No International orders accepted.

CODE MW07

2201 Pine Drive
Dickinson, Texas 77539
Internet http://phoenix.net/~megahaus

Prices and specifications subject to change. Some exceptions may apply to low price guarantee. All trademarks are registered trademarks of their respective companies. Returns must be in new condition, and may be subject to restocking fee. Shipping is not refundable. Personal checks held for clearance. © MegaHaus '95

Circle 245 on reader service card

ProDirect 800-524-9952

Professional Service...Products Direct

Fax 24 hours a day 612-941-1109
International orders call 612-941-1805
In Minnesota call 612-941-1805

- No surcharge on credit cards
- No out of state sales tax collected
- Most orders shipped same day
- Your choice of a Mac system cable or daisy chain cable with each external drive
- 30 day money back guarantee on all hard drives
- Corporate and Government POs welcomed

CD Rom Drives

NEC **2VMac**	320ms access, 300Kb/sec transfer, 1 year warranty	$245
Chinon **CDA525 Dual Speed**	280ms access, 300Kb/sec transfer, 1 year warranty	$225
Chinon **CDA535 Dual Speed**	220ms access, 300Kb/sec transfer, 1 year warranty	$245
NEC **3Xp**	240ms access, 500Kb/sec transfer, 1 year warranty	$395
NEC **4Xe**	220ms access, 600Kb/sec transfer, 1 year warranty	$495
Plextor **QuadSpeed**	235ms access, 600Kb/sec transfer, 1 year warranty	$499
TOSHIBA QuadSpeed	120ms access, 600Kb/sec transfer, 1 year warranty	$299

Digital Linear Tape Drives

Quantum DLT

Model	Capacity	Trans.Rate	Media	Price(Ext)
DLT2000	20GB	2.5MB/sec	DLT20	2995.00
DLT4000	40GB	3MB/sec	DLT40	Call!

Ideal backup solution for network servers & highend workstations & systems!

Quantum Quantum Quantum

	Capacity	Seek	RPM	Cache	Warranty	Int.	Ext.
LPS	170 MB	14 ms	3600	128K	2 Year	135	195
Maverick	540 MB	14 ms	3600	128K	2 Year	215	275
LPS	340 MB	12 ms	4500	128K	2 Year	169	229
DSP3053	535 MB	9.5 ms	5400	512K	5 Year	225	285
Lightning	730 MB	11 ms	4500	128K	2 Year	255	315
Trailblazer	420 MB	11 ms	4500	128K	3 Year	Call	Call
Trailblazer	850 MB	11 ms	4500	128K	3 Year	Call	Call
Fireball	540 MB	10 ms	5400	128K	3Year	Call	Call
Fireball	1080 MB	10 ms	5400	128K	3 Year	Call	Call
Grand Prix	2100 MB	9.5 ms	5400	512K	5 Year	915	975
Grand Prix	4200 MB	8.6 ms	7200	512K	5 Year	1395	1455
Atlas	1.0 GB	9 ms	7200	1024K	5 Year	Call	Call
Atlas	2.1 GB	9 ms	7200	1024K	5 Year	920	990
Atlas	4.3 GB	12 ms	7200	512K	5 Year	1535	1595

Powerbook Drives

	Capacity	Size	Access	Cache	Warranty	Int.	Ext.
Daytona	256 MB	2.5"	17ms	128K	1 Year	240	340
Daytona	341 MB	2.5"	17ms	128K	1 Year	295	395
Daytona	514 MB	2.5"	14ms	128K	1 Year	415	515

Genuine Products by SyQuest

Capacity	Seek	RPM	Int.	Ext.
88 MB SQ5110C	20ms	3200	300	360
200 MB SQ5200	18 ms	3200	420	480
270 MB SQ3270	13.5ms	3200	420	480

2 Year Warranty on all SyQuest Drives
SyQuest drives come complete with a cartridge (Formatted or Unformatted) and the latest SCSI 4.3 compatible software.

SyQuest Media

Capacity	Model	Warranty	Price
44 MB	SQ400	5 year	$41
88 MB	SQ800	5 year	47
105 MB	SQ310	5 year	53
200 MB	SQ2000	5 year	75
270 MB	SQ327	5 year	63

One FREE Cartridge included with all SyQuest Drives!

MICROPOLIS MICROPOLIS Price and Performance

	Capacity	Seek	RPM	Cache	Warranty	Int.	Ext.
M4221	2.1 GB	8.5 ms	7200	512K	5 Year	935	995
M1936	3.6 GB	11 ms	5400	512K	5 Year	1225	1325
M43243	4.3 GB	8.5 ms	7200	512K	5 Year	1355	1415
M1991	9.0 GB	11 ms	5400	512K	5 Year	2170	2270
M4221W	2.1 GB	8.5 ms	7200	512K	5 Year	1035	1095
M43243W	4.3 GB	8.5 ms	7200	512K	5 Year	1455	1515
M1991W	9.0 GB	11 ms	5400	512K	5 Year	2270	2370

Micropolis M4221 2.1 GB $935.00

- *Formatted Capacity*
- *7200 RPM*
- *512K cache*
- *5 year warranty*

MICROPOLIS AV Drives-BEST for Music & Video

	Capacity	Seek	RPM	Cache	Warranty	Int.	Ext.
M4221AV	2.1 GB	8.5 ms	7200	512K	5 Year	985	1045
M1936AV	3.6 GB	11 ms	5400	512K	5 Year	1275	1375
M43243AV	4.3 GB	8.5 ms	7200	512K	5 Year	1455	1515
M1991AV	9.0 GB	11 ms	5400	512K	5 Year	2315	2415
M4221WAV	2.1 GB	8.5 ms	7200	512K	5 Year	1085	1145
M43243WAV	4.3 GB	8.5 ms	7200	512K	5 Year	1525	1585
M1991WAV	9.0 GB	11 ms	5400	512K	5 Year	2395	2495

Kingston TECHNOLOGY CORPORATION

Removable Drive Carriers

- *Provides ability to easily remove and transport data.*
- *Ideal for disk array environments.*
- *Compatible with single ended, narrow differential, and fast and wide SCSI disk drives.*
- *SCSI ID select number is clearly displayed on front panel of the receiving frame.*
- *Key locked to prevent untimely or unauthorized removal of the drive carrier.*
- *5 year warranty.*

Optical Drives

Hewlett Packard, Fujitsu, & MaxOptics

Capacity	Model	Access	Int.	Ext.
1.3 GB	HP1716T	23.5ms	2235	2295
230 MB	M2512	30ms		585
1.3 GB	Tahiti III	18ms	2335	2395

Scanners

Nikon	Scantouch	$1199
	Transparency Adapter	$499
	Coolscan 35mm film scanner	$1399
UMAX	UC630/1260	675/1240
	Vista-S6	760
	Powerlook	3250

Hard Drive Cabinets

Zero Footprint	$75
MicroCab	$89
Full Height	$139
Multi Bay Cabinets	$CALL

Two, four, six, and eight bay cabinets available. All cabinets come with a 25-50 pin Mac system cable and a power cable. 1 year warranty on all cabinets.

VISA MasterCard

Business Hours
8:00am-7:00pm (CST) Mon.-

All prices are subject to change without notice. Refused orders are subject to a restocking fee. International customers pay all shipping charges. All shipping charges are non-refundable. To return merchandise call for an RMA number. All RMAs must be returned within 10 business days of issuance. Customers are responsible for shipping charges to return product

MICROPOLIS 3.5" Stackable Disk Subsystems

LT Super Capacity External StΩrage

M2100	2.1 GB	8.9 ms	7200	512K	5 Year	*Call for the most*
M4200	4.2 GB	8.9 ms	7200	512K	5 Year	*competitive prices!*

SPRING SPECIALS

Quantum 170MB ..... ***Int. $135 Ext. $195***
3600 RPM, 14 ms seek, 128K cache, 2 year warranty

Quantum 340MB ..... ***Int. $165 Ext. $225***
4500 RPM, 12 ms seek, 128K cache, 2 year warranty

Quantum 535MB ..... ***Int. $225 Ext. $285***
DSP 3053, 5400 RPM, 9.5 ms seek, 512K cache, 2 year warranty

Quantum 730MB ..... ***Int. $255 Ext. $315***
Lightning 730, 4500 RPM, 11 ms seek, 128K cache, 2 year warranty

Conner 1.0 GB ..... ***Int. $475 Ext. $535***
CFP1080, 5400 RPM, 9 ms seek, 5 year warranty

Quantum Grand Prix2.0 GB ..... ***Int. $895 Ext. $955***
Q4200, 5400 RPM, 9 ms seek, 512K cache, 5 year warranty

Micropolis 4.0GB ..... ***Int. $1355 Ext. $1415***
M3243, 7200 RPM, 8.5 ms seek, 512K cache, 5 year warranty

Seagate Seagate Seagate Seagate Seagate

	Capacity	Seek	RPM	Cache	Warranty	Int.	Ext.
Hawk 2LP	1.2 GB ST31200N	9.5ms	5400	512K	5 Year	$535	$595
Hawk 4	4.2 GB ST15230N	9ms	5400	512K	5 Year	1325	1385
Barracuda	2.4 GB ST32550N	8ms	7200	1024K	5 Year	1055	1115
Barracuda	4.2 GB ST15150N	8ms	7200	1024K	5 Year	1475	1535
Barracuda	2.4 GB ST32550W	8ms	7200	1024K	5 Year	1125	1195
Barracuda	4.2 GB ST15150W	8ms	7200	1024K	5 Year	1575	1635
Elite	9 GB ST410800N	11ms	5400	512K	5 Year	2960	3060

FUJITSU FUJITSU FUJITSU FUJITSU FUJITSU

	Capacity	Seek	RPM	Cache	Warranty	Int.	Ext.
M2684	530 MB	10ms	5400	512K	5 Year	220	280
M1606	1.0 GB	10ms	5400	512K	5 Year	525	585
M2915	2.1 GB	10ms	5400	512K	5 Year	945	995

ProDirect, Inc. 6824 Washington Ave. South Eden Prairie, MN 55344

Tape Backup Drives

HEWLETT PACKARD

2.0 GB	$835	$885
HP35470, 15MB/min., 4mm media, 1 Year warranty		
3-5 GB	995	1055
HP35480, 45MB/min., 4mm media, 1 Year warranty		
4-10 GB	1225	1285
HP1533, 60MB/min., 4mm media, 1 Year warranty		
20-50 GB Auto Tape Loader	3195	3295
HP1553, 60MB/min., 4mm media, 1 Year warranty		
Exabyte		
2-5 GB	1425	1495
8205, 263KB/sec., 8mm media, 1 Year warranty		
7-14 GB	2250	2310
8505XL, 500KB/sec, 8mm media, 1 Year warranty		

All tape backup drives include 1 piece of media and Retrospect backup software.

DeskTape™
Allows you to mount your DAT on the desktop, Backing up your data is as easy as drag and drop.

Memory Products

Memory	Centris & Quadra
2x8x80	4MB 60/70ns
4x8x80 60/70ns	8MB 60/70ns
4x8x80FX	16MB 70ns
16x8x80LowProfile	32MB 60ns
16x8x80 FX	VRAM

Powerbook Memory
520,520c,540,540c
4MB,8MB,16MB,32MB
140,170,160,165c,180,180c,Duos
4MB,6MB,8MB,10MB
12MB,14MB,20MB

Lifetime warranty on all memory products!!!

Circle 135 on reader service card

Call Now For Our Newly Expanded Macintosh

J&R COMPUTER WORLD

One of America's Largest Authorized Apple Dealers

iomega Zip™ Drive for Macintosh
•Works like a hard drive •Unlimited storage on inexpensive 100MB disks •Portability and easy plug-and-play set-up •Comes with a SCSI cable and one 100MB removable disk

$194.99
(BER ZIP100SCSI)

100MB DISK $19.99 (BER MAC100MBDSK)
100MB DISK 3PK $49.99 (BER MAC100MBTRI)
100MB DISK 10PK $149.99 (BER MAC100MBTEN)

Spirit Technologies External Hard Drives

365MB •18ms...(SIT 365HDO1)	$279.99
540MB •18ms...(SIT 540HDO1)	$329.99
730MB •18ms...(SIT 730HDO1)	$389.99
1GIG •15ms...(SIT 1GBHDO1)	$629.99
2GIG •14ms...(SIT 2GBHDO1)	$1229.99
4GIG •17ms...(SIT 4GBHDO1)	$1899.99

MicroNet External Hard Drives

340MB •13ms(MNT ADV-340MBE)	$399.99
500MB •14ms(MNT ADV-500MBE)	$449.99
1GIG •10ms (MNT ADV-1000E)	$779.99
2GIG •10ms (MNT ADV-2000E)	$1299.99
4GIG •10ms (MNT 4GIGEXT)	$2699.99

MicroNet Advantage External 200MB SyQuest® Drive
•Provides the advantages of primary storage, archiving, file transport & backup •Includes one cartridge, SCSI system cable & software •18ms access

$549.99
(MNT ADV-SYQ200E)

External 270MB SyQuest® Drive (MNT ADV-SYQ270E) ... $549.99

SyQuest® Cartridges

44MB Cartridge ...(SYQ 45MEGREMOV)	$39.99
88MB Cartridge ...(SYQ 88REMOVE)	$44.99
105MB Cartridge ...(SYQ 105REMOVE)	$54.99
200MB Cartridge ...(SYQ 200MEGREMOV)	$74.99
270MB Cartridge ...(SYQ 270REMOVE)	$59.99

Media Vision Reno Portable CD-ROM
•Double speed CD-ROM •SCSI 2 •180ms access time •Works with AC adapter or battery •Includes headphones, carrying case, AC adapter & cables

$269.99
(MDV MV450-RENO)

Spirit Technologies External 4x CD-ROM Kit
•Quad-speed (150ms, 600KB/sec.) CD-ROM drive •Koss stereo speakers •Headphones •Software includes Grolier's Multimedia Encyclopedia and Oceans Below •Two-year warranty

$399.99
(SIT CDR-4BUNDLE)

External Double-Speed CD-ROM Kit (SIT CDR-BUNDLE) ... $229.99

Global Village Teleport Gold II External Data/Fax Modem
•Sends & receives data & faxes at up to 14,400 bps •Includes GlobalFax™ software & cables

$129.99
(GLV TELEPORTGD2)

External 28.8bps Fax/Modem 28.8 Data, 14.4 Fax (GLV TELEPRTPLTN) ... NEW ... $229.99

Internal 28.8 Data/14.4 Fax Modem for PowerBooks 145, 160, 165, 180 (GLV PWRPRTPLTNM) NEW $339.99

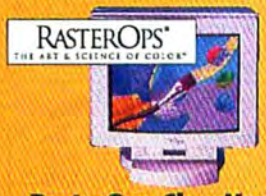
Zoom V.34 EXT Macintosh 28,800bps Fax/Modem
•Internationally approved V.34 standard for 28,000bps uncompressed data transmission plus V.Fast Class compatibility •Includes Microphone LT & FAXstf

$179.99
(ZOP V34XMAC)

Radius PrecisionColor 17"
•Sony Trinitron .26mm dot pitch •Supports built-in Macintosh video •Meets Swedish MPR II guidelines •1360x1024 with Radius card •1 year Worry Free Radius Warranty

$979.99
(RAD PRECOLOR17)

SuperMac Thunder 24-GT Video Card (SPM THUND24-GT) ... $1399.99
SuperMac Thunder IV GX-1152 (SPM THUND4-1152) ... $1995.99



RasterOps ClearVue 20"
•20" Sony Trinitron •640x640 to 1280x1024 resolution •Digital LCD controls •Anti-glare, anti-static Energy Star •Supports built-in Macintosh video on Centris, Quadras and PowerMac

$1699.99
(RAS CLEARVUE20T)

PaintBoard Prism-GT from RasterOps (RAS PRISM-GT) ... $899.99

FastMac V.34 28.8 Data/Fax Modem
•28,800bps data and 14,400bps fax transfer rate •Maximum throughput of up to 115,200bps with V.42bis/MNP 5 data transfer •Includes cables and software •*Made in the USA*

$139.99
(FSM FMACV34)

SupraExpress™ 144 Plus FAXModem
•14,400 bps fax/data speed •LED display modem status •Includes FAXcilitate™, MicroPhone™ LT & cables •5-year limited warranty

$99.99
(SRA 50-14XP-MC)

External 28.8bps Data/Fax Modem (SRA 50-V34E-MC) ... $219.99
Internal 28.8bps Fax/Modem for PowerBooks (SRA 50-28FE-PB) ... $299.99

MAIL ORDERS

J&R Computer World Dept. MW0795 • 59-50 Queens Midtown Expressway • Maspeth, Queens NY 11378
CALL 1-800-221-8180 for shipping information. DO NOT SEND CASH.

VISA MasterCard DISCOVER

Catalogue With A Full Line Of Mac Hardware

Authorized Catalogue Reseller

1-800-221-8180

24 Hours A Day, 7 Days A Week, Anywhere In The USA

Hewlett-Packard DeskWriter 660C Color Printer
•600 X 300 dpi black & white & 300 x 300 dpi color printing •2-ink cartridges •Macintosh System 7 compatible •35 scalable fonts •256 levels of gray •Integrated spooling for faster print speed •3-year limited warranty

$499.99 (HP C2165A)

LaserJet 5MP •3MB, 600dpi, 4ppm
(HP C3155A) **$1099.99**

Hewlett-Packard ScanJet IIIc Color Scanner
•Ideal for both monochrome & color graphics & text •High quality 600 dpi resolution •Fast 1-pass image scanning •Includes Photoshop LE, OCR software and cables

$979.99 (HP C2529A)

ScanJet IIIp •Grayscale, 300dpi
(HP SCANJET3PA) **$479.99**

Hewlett-Packard LaserJet 4ML Printer
•Now powerful PostScript printing is within reach •4MB memory •Lightning fast Intel 80960 18.5MHz RISC processor •Auto switching between Adobe PostScript Level 2 & enhanced HP PCL5 •80 scalable fonts •300 dpi •Super compact

$966.99 (HP LASERJET-4ML)

UMAX BizCard Reader
•Read, store & manage your business card collection •Plug & play-plugs into parallel port •Background processing •Real time/deferred processing •Includes database manager

$239.99 (UMX BCRMAC)

Vista-T630 •600x300dpi, 24-bit
(UMX SOHOMAC) **$499.99**

Wacom ArtZ 6"x8" Graphics Tablet
•Graphics Tablet with UltraPen™ lets you create art, personalize documents & more •Small & lightweight- it allows you to draw, illustrate & paint

$299.99 (WAC UD0608A)

12"x12" Tablet
(WAC UD12X12) **$529.99**

ArtPad
(WAC ARTPAD-MAC) **$149.99**

Kensington Turbo Mouse® 4.0
•The only trackball with fully integrated hardware & software •Space saving design with comfortable large-diameter ball, easy-click buttons, ultra-smooth long-lasting bearings & 2 ADB ports •Includes custom software

$109.99 (KEG 64100)

Thinking Mouse
(KEG 64101) **$89.99**

PNY 72-Pin 70ns Memory Simms
for Centris & Quadra

4MB Simms
...(PNY 4MEG05) **$169.99**

8MB Simms
...(PNY 8MEG05) **$339.99**

16MB Simms
...(PNY 16MEG01) **$499.99**

PNY Memory Simms
For PowerBooks 500 Series

4MB Simms
...(PNY PM1912LLA) **$229.99**

8MB Simms
...(PNY PM1913LLA) **$399.99**

16MB Simms
...(PNY PM1914LLA) **$699.99**

Broderbund Myst
$49.95
(BRM MYST-C)
CD-ROM

Grolier Multimedia Encyclopedia '95
$59.95
(GRM GROLIER95-C)
CD-ROM

ProPhone Select Phone '95
$149.95
(PCI SELECT95-C)
CD-ROM

Symantec Norton Utilities 3.1
$99.95
(SMM NORTON3.1)

Graphix Zone Bob Dylan Highway 61
$39.95
(GZI BOBDYLAN-C)
CD-ROM

Other Available Software

Poetry in Motion •CD-ROM ...(VOI POETRY-C)	$19.95
Marathon ...(BJM MARATHON)	$39.95
Quicken 5.0 ...(IUM QUICKEN5)	$44.95
Gadget •CD-ROM ...(SYM GADGET-C)	$49.95
RamDoubler •Mac/PowerMac ...(CNM RAMDOUBL-MP)	$59.95
Word Perfect 3.1 Student Essentials ...(WPM WP31STUDENT)	$79.95
System 7.5 ...(APP 2920LL)	$89.95
Berlitz Think & Talk Freanch •CD-ROM ...(HYM FRENCH-C)	$99.95
Works•Mac/PowerMac ...(CLM WORKS)	$129.95
Office 4.21 ...(MSM OFFICE4.21)	$479.95

Not responsible for typographical or pictorial errors.
Some quantities may be limited.
All merchandise brand new, factory fresh and 100% guaranteed!

Circle 282 on reader service card

CALL FOR EXPERT SERVICE AND COMPETITIVE PRICING

DIRECTTech Drives...

To Meet Your Storage Needs

HARD DRIVES

MICROPOLIS

5 YEAR WARRANTY

Capacity		Model #	Seek	RPM	Internal	External
2.4 GB	(3.5")	DT-4221 LOW PROFILE	8 MS	7200	$999	$1064
3.6 GB	(5.25")	DT-1936	11 MS	5400	$1299	$1399
4.0 GB	(3.5")	DT-3243	8.5 MS	7200	$1399	$1465
9.0 GB	(5.25")	DT-1991	11 MS	5400	$2345	$2499

MICROPOLIS AUDIO/VIDEO SERIES

Capacity		Model #	Seek	RPM	Internal	External
2.4 GB	(3.5")	DT-4221AV LOW PROFILE	8 MS	7200	$1050	$1114
3.6 GB	(5.25")	DT-1936AV	11 MS	5400	$1399	$1499
4.0 GB	(3.5")	DT-3243AV	8.5 MS	7200	$1450	$1515
9.0 GB	(5.25")	DT-1991AV	11 MS	5400	$2445	$2599

Seagate

NEW LOW PRICING!!! 5 YEAR WARRANTY

Capacity		Model #	Seek	RPM	Internal	External
1.2 GB	(3.5")	DT-31200	10 MS	5400	$565	$630
2.4 GB	(3.5")	DT-12400	9 MS	5400	$1050	$1125
2.4 GB	(3.5")	BARRACUDA 2 LP	8 MS	7200	$1075	$1140
2.4 GB	(3.5")	BARRACUDA 2 WIDE	8 MS	7200	$1199	$1299
4.2 GB	(3.5")	BARRACUDA 4	8 MS	7200	$1499	$1565
4.2 GB	(3.5")	BARRACUDA 4 WIDE	8 MS	7200	$1599	$1799
3.5 GB	(5.25")	ELITE 3	10 MS	5400	$1979	$2079
9.0 GB	(5.25")	ELITE 9	11 MS	5400	$3095	$3195

HEWLETT PACKARD

5 YEAR WARRANTY

Capacity		Model #	Seek	RPM	Internal	External
1.2 GB	(3.5")	DT-C3323	10 MS	5400	$750	$810
2.4 GB	(3.5")	DT-C2490	8.5 MS	6400	$1199	$1299

Quantum

2 YEAR WARRANTY

Capacity		Model #	Seek	RPM	Internal	External
365 MB	(3.5")	LTG365	10 MS	4500	$195	$265
540 MB	(3.5")	LPS540	10 MS	4500	$240	$299
730 MB	(3.5")	LPS730	11 MS	4500	$289	$350
1.0 GB	(3.5")	EM1080	9.5 MS	5400	$605	$665
1.4 GB	(3.5")	EM1400	9.5 MS	5400	$775	$835
2.1 GB	(3.5")	EM2100	9.5 MS	5400	$999	$1065

IBM

IBM QUALITY! 5 YEAR WARRANTY

Capacity		Model #	Seek	RPM	Internal	External
1.2 GB	(3.5")	IBM0662	8 MS	5400	$620	$680
2.35GB	(3.5")	IBM0664	9 MS	5400	$1075	$1175
4.0 GB	(3.5")	IBM34320	8 MS	7200	$2200	$2300

All Drives are preformatted, tested and packaged with SCSI Manager 4.3 compatible drivers.
External configuration includes choice of 25-50 or 50-50 pin double shielded, twisted pair cable.
Ask your Sales reprasentative about ACTIVE TERMINATION.

SyQuest REMOVABLE

Capacity	Model #	Internal	External
44/88MB	SQ5110C	$305	$365
105 MB	SQ3105	$245	$305
200 MB	SQ5200	$425	$485
270 MB	SQ3270	$425	$485

SYQUEST Drives include ANUBIS formatting software and 1 free cartridge

SYQUEST MEDIA NEW LOW PRICING!

44 MB	$42	105 MB	$54
88 MB	$48	200 MB	$76
		270 MB	$64

CD ROM DRIVES

Make	Model #	Seek	External
Toshiba CD ROM	DT-4101	320MS	$275
Toshiba CD ROM	DT-3401E	200MS	$395
Toshiba CD ROM	DT-3501E 4x	120MS	$430

MAKE YOUR OWN CD!!!
JVC Personal Archiver $1999

TAPE BACKUP

Capacity	Model #	Format	External
4.0GB	SONY 5200	DDS-2	$1080
4-8GB	SONY 5000	DDS-2	$1199
4-8GB	HP 1533A	DDS-2	$1375
2-5GB	EXABYTE 8205	8MM	$1499
5-10GB	EXABYTE 8505	8MM	$2275

OPTICAL

Capacity	Model #	Seek	External
230MB	FUJITSU 230OP	28MS	$825
1.3GB	HP C1716	23MS	$2299
1.3GB	MAXOPTIX TAHITI III	18MS	$2399

MEDIA

1 GB	$100	128 MB	$30
1.3 GB	$89	230 MB	$39

DISK ARRAYS

Capacity	Model #	Seek Time	Trans. Rate	Price
2.0GB	DT-31200AR	5MS	7MB per sec.	$CALL
4.0GB	DT-32550AR	4.5MS	8MB per sec.	$CALL

Disk Arrays include Trillium Research Software and ATTO SCSI Accelerator Board. Great for Radius VIDEO VISION!!!

SOFTWARE

Connect your Mac to the Internet/Unix with Intercon Software. Call for lowest prices.

INTRODUCING...

MICRODISK® AV LT & LS from MICROPOLIS

The Stackable, Removable, Gigabyte Drive Subsystem CALL for Information and Prices

CALL NOW!!!

1-800-279-5520

DIRECTTech SYSTEMS INC.

7615 Golden Triangle Drive-Suite M
Eden Prairie, MN 55344
Int'l Orders (612) 941-2616 • Fax: (612) 942-0430

VISA MasterCard

****SPECIALS****

$1075
SEAGATE BARRACUDA 2 LP
• 8 MS SEEK • 7200 RPM • FAST-SCSI-2 •
• 5 YEAR WARRANTY • INTERNAL CONFIGURATION

$1399
MICROPOLIS 4.0 GB CAPACITY
• 8.5 MS SEEK • 7200 RPM • FAST SCSI-2
• 5 YEAR WARRANTY • INTERNAL CONFIGURATION

No charge for Visa or Mastercard! Gov't., Corp., University., P.O.'s welcome. RMA# required for all returns. Prices, Terms and Availability subject to change without notification.

30 DAY MONEY BACK GUARANTEE (on drive products only)

CALL FOR EXPERT SERVICE AND COMPETITIVE PRICING

Circle 298 on reader service card

The Mac Zone™

Established 1986

your Macintosh® catalog SuperStore

- Full line of Apple Macintosh® computers
- Over 3,000 products
- Serving Mac users since 1986
- Lowest Catalog Prices or we give you FREE SHIPPING!
- Next Day Delivery only $3* *Up to 10 lbs.

OVERNIGHT DELIVERY VIA AIRBORNE EXPRESS

Super-fast 28,800 bps speed – perfect for downloading graphics, video and sound files!

Magnum™ 288 V.34 Data/Fax Modem

HOT!

Only $148.98

Order #90605

Your fast, affordable connection to the online world!

SAVE!

Only $89.98

Order #90620

Performantz 14,400 bps S/R External Fax Modem

The fastest CD-ROM technology available!

Only $298.98

Performantz Quad Speed CD-ROM Drive

Order #01124

#94099 Performantz Mini 2X CD-ROM Drive $178.98

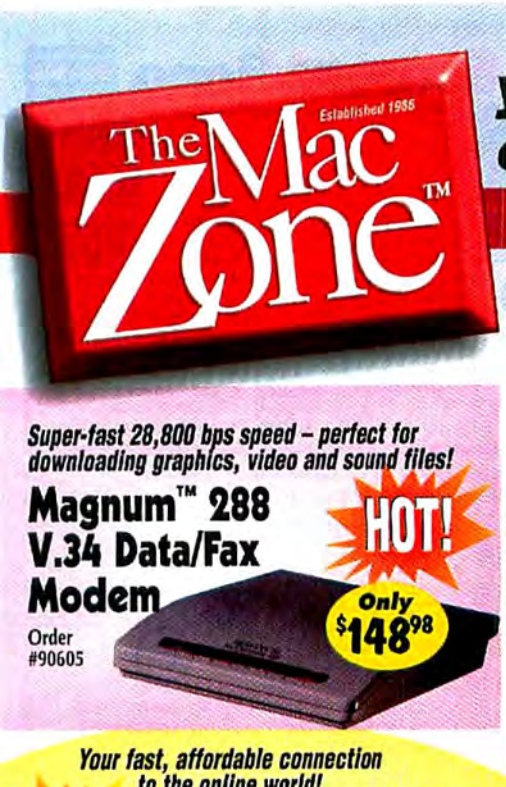
More action-packed than the award-winning original!

DOOM II for Mac

Only $46.98

IT'S HERE!

Order #92035



THE ONLINE ACCESS PACK

It's never been so easy to get on the Information Superhighway!

Only $29.98

Order #91694

Here's what you get:

Internet Starter Kit for Macintosh® 2nd Edition

Everything you need to jump onto the Internet and be productive! Includes over a dozen essential Internet tools and utilities, special online discounts, and much more.

PLUS 3 Extra Values at NO Extra Cost!

PERSONAL TRAINING SYSTEMS

1 PTS Official Guide to Netscape Navigator™ on CD-ROM

Learn to navigate the Internet like an expert with this interactive step-by-step tutorial.

2 CompuServe Starter Kit

Discover the incredible diversity of the world's most comprehensive online service…CompuServe.

e•World

3 Apple® eWorld™ Starter Kit

A unique online communication and information service, eWorld keeps you in-touch, informed and entertained.

Full line of Apple® Power Macintosh®, PowerBook®, Performa® and Quadra® computers BY MAIL!

Call Today for your FREE CATALOG!

Before you buy, call The Mac Zone

1-800-436-0606

For the best Macintosh products at better than Warehouse and Superstore prices.

Fax (206) 603-2500 • International (206) 603-2550 • CompuServe code: GO MZ

CORPORATE SALES	GOVERNMENT SALES	EDUCATION SALES	INTERNATIONAL SALES	eWorld
1-800-258-0882	1-800-372-9663	1-800-381-9663	1-206-603-2570	@MACZONE

©1995 Multiple Zones International, Inc. All rights reserved.

The Mac Zone Trusted Internationally

France – 33 14688 4040	Fax: 33 14790 6903	Brazil – 55 193 34 59 86	Fax: 55 192 39 0765
United Kingdom – 44 483 211 456	Fax: 44 483 211 567	Colombia – 57 1 600 2908	Fax: 57 1 214 6492
Scandinavia – 45 86 11 81 83	Fax: 45 86 11 81 33	Venezuela – 58 2 713197	Fax: 58 2 7604970
Germany – 49 40 551 6066	Fax: 49 40 551 2151	Hong Kong – 852 2851 1750	Fax: 852 2581 0359
Switzerland – 411 401 4070	Fax: 411 401 4073	Japan – 81 3 5454 7226	Fax: 81 3 5454 7212
Benelux – 31 20 606 2299	Fax: 31 20 606 5888	Singapore – 652 965 555	Fax: 652 965 556
Portugal – 351 1 387 4558	Fax: 351 1 386 3801	Malaysia – 652 965 555	Fax: 652 965 556
Spain – 351 1 387 4558	Fax: 351 1 386 3801	Indonesia – 68 21 530 4567	Fax: 68 21 530 4715
Mexico – 525 611 4646	Fax: 525 563 5025	Middle East – 971 4 359 800	Fax: 971 4 359 997

MW507 PLEASE USE THIS CODE TO RECEIVE THESE SPECIAL PRICES
Circle 71 on the reader service card

YES! START MY FREE 1-YEAR CATALOG SUBSCRIPTION ASAP!

☐ MAC ZONE ☐ PC ZONE

I buy primarily for: _Home Use _Business Use _Work-from-Home Use

Name _____

Address _____ Apt _____

City _____ State _____

Zip _____

Mail to: The Mac Zone, 15815 SE 37th St., Bellevue, WA 98006-1800 MW507

$0 Down Business Leasing from SuperMicro

SuperMicro $100,000 Lease Credit

8100 Systems

8100/80 Superstation

0 Down! $228 per month

- PowerPC 8100/80MHZ
- Internal CD ROM
- 40MB RAM
- 2.1GB internal hard drive
- Extended keyboard
- Apple 17" Trinitron monitor
- Radius Thunder 24 video card
- dsc 12000c, 9600x9600 dpi color flatbed scanner
- TI MicroLaser PowerPro, 600 dpi, 8.5" x 11", 12 ppm printer w/ 2 AppleTalk connectors
- Wacom 12x12 Graphics Tablet
- SuperMicro Extended Services

CPU Starting at $2599

$7.49 A DAY!

8100/100 Video Workstation

0 Down! $452 per month

- PowerPC 8100/100MHZ
- Internal CD ROM
- 72MB RAM
- 2.1GB internal hard drive
- Extended keyboard
- Radius 21" Trinitron monitor
- Radius Thunder 24 video card
- Radius Video Vision Studio Pro Pak including 4.0GB Fast&Wide disk array w/ Fast&Wide SCSI controller
- Internal SDT-5000 DAT tape drive w/ 1 FREE tape
- SuperMicro Extended Services

CPU Starting at $3199

$14.86 A DAY!

8100/110 Ultimate Graphics Workstation

0 Down! $656 per month

- PowerPC 8100/110MHZ
- Internal CD ROM
- 136MB RAM
- 4.0GB internal hard drive
- Sony 20SE Trinitron monitor
- Radius Thunder IIGX 1600
- Multifunctional SyQuest 200 /Sony 650 optical w/ SyQuest 200 cartridge, 650MB optical cartridge
- Umax PowerLook 1200 dpi color flatbed scanner w/full Photoshop
- Xante Accel-A-Writer 8200, 600x 600dpi, 11.8"x25", 12MB RAM, Ethernet
- Two Xante toner cartridges
- Wacom 12x18 Graphics Tablet Electrostatic
- SuperMicro Extended Services

$21.56 A DAY!

CPU Starting at $4199

7100 Systems

7100/66 Valuestation

0 Down! $185 per month

- PowerPC 7100/66MHZ
- Internal CD ROM
- 40MB RAM
- 540MB hard drive
- Extended keyboard
- External SyQuest 88c w/ FREE cartridge
- Sony 17SF Trinitron monitor
- dsc 6000c, 2400x2400 dpi scanner w/ PS LE
- Radius Thunder 24 video card
- TI Pro 600, 600 dpi, 8 ppm printer w/ 2 AppleTalk connectors
- Wacom 6x8 Artz Graphics Tablet
- SuperMicro Extended Services

$6.08 A DAY!

CPU Starting at $2199

7100/80 Paperless Office

0 Down! $239 per month

- PowerPC 7100/80MHZ
- Internal CD ROM
- 40mb RAM
- 1.0GB hard drive
- Extended keyboard
- Sony 20SE Trinitron monitor
- Radius Thunder 24 video card
- GlobalVillage Teleport Gold fax modem
- Umax UC630 scanner w/ page feeder and OCR software
- Pinnacle Micro CDR-1000 CD-ROM Recorder

$7.85 A DAY!

CPU Starting at $2399

7100/80 Designstation

0 Down! $264 per month

- PowerPC 7100/80MHZ
- Internal CD ROM
- 72MB RAM
- 1.0GB hard drive
- Extended keyboard
- Turbo SyQuest 200 external w/ 1 FREE cartridge
- Sony 20SE Trinitron monitor
- Radius Thunder 24 video card
- dsc 8000c, 3600x3600 dpi scanner w/ full Photoshop
- TI MicroLaser Pro 600 PS23, 600 dpi, 8 ppm printer w/ 2 AppleTalk connectors
- Wacom 12x12 Graphics Tablet
- SuperMicro Extended Services

$8.67 A DAY!

CPU Starting at $2599

6100 Systems

6100/66 Data Entry Workstation

0 Down! $95 per month

- PowerPC 6100/66MHZ
- Internal CD ROM
- 24MB RAM
- 540MB internal hard drive
- Extended keyboard
- Apple 15" Trinitron monitor
- TI MicroLaser Pro 600, 600 dpi, 8 ppm printer w/ 2 AppleTalk connectors
- SuperMicro Extended Services

$3.12 A DAY!

CPU Starting at $1499

6100/60 DTP Solution

0 Down! $159 per month

- PowerPC 6100/66MHZ
- Internal CD ROM
- 24MB RAM
- 540MB internal hard drive
- Extended keyboard
- External SyQuest 88c w/ cartridge
- Sony 17SF Trinitron monitor
- Radius 24xk video card
- dsc 6000c, 2400x2400 dpi color flatbed scanner w/Transparency and Photoshop LE
- TI Pro 600, 600 dpi printer w/ 2 AppleTalk connectors
- Wacom 6x8 Artz Graphics Tablet
- SuperMicro Extended Services

$5.22 A DAY!

CPU Starting at $1399

System Specials

Every SuperMicro system is completely assembled and tested before shipping—all ready to run.

CPU/XKey/Mouse	Monitor/Card	Cash	Lease	
8100/110/16/2.0GB/CD	None/Thunder 24	$5299	$121	SALE
8100/110/72/2.0GB/CD	Sony 17"/Thunder 24	$8049	$184	
8100/110/136/4.3GB/CD	Sony 20"/Thunder 24	$12,228	$280	SALE
8100/80AV/72/540/CD	Sony 17"/Thunder 24	$7499	$171	
7100/66/24/1.0GB	Sony 17"/Thunder 24	$4699	$107	
7100/80/40/700/CD	Sony 20"/Thunder 24	$7295	$167	
6100/66/24/540	14" hi-res color monitor	$2575	$58	
Q800/32/1.0GB/CD	Sony 20" Dos Card	$7599	$174	SALE

Monthly Specials

Fully Loaded 8100/110 $5299!

- PowerMac 8100/110 CPU
- 16MB RAM
- 2GB hard drive
- Internal dual-spin CD-ROM
- Radius Thunder 24 series IV video card

Low Price

radius

While they last!

Scanners

ScanMaker IIHR $828!

- 24-bit color
- 600 dpi resolution
- Includes color calibration system

Scanner	Description	Price	
dsc 6000c	600 dpi flatbed w/PS LE	$449	
dsc 8000c	800 dpi flatbed w/PS LE	$549	
dsc 12000C w/trans	1200 dpi flatbed w/PS LE	$949	SALE
Agfa StudioScan II	400 dpi flatbed	$829	
Agfa Arcus II w/trans	1200 dpi flatbed	$2709	
ScanMaker III	1200 dpi flatbed	$2479	
ScanMaker IIHR	600 dpi flatbed	$828	SALE
Umax PowerLook	1200 dpi flatbed	$2479	SALE
Nikon CoolScan	2700 dpi slide	$1449	
Polaroid SprintScan	2700 dpi slide	$1859	
StudioScan II adapter	transparency upgrade	$379	
Microtek adapter	transparency upgrade	$519	

Printers

TI MicroLaser Pro 600 PS23 $1189!

- 600 dpi camera ready output
- 8.5" x 11" print size
- 500 sheet capacity

Model	Resolution	Size	Price	
TI MicroLaser Pro 600 PS23	600x600	8.5"x14"	$1189	SALE
TI MicroLaser Pro E	600x600	8.5"x14"	$1365	
TI MicroLaser PowerPro	600x600	8.5"x14"	$1629	
Primera Pro Color	300x600	8.5"x11"	$1499	
Primera Pictura 310 Color	300x300	12"x18"	$3899	
Epson StylusColor	300x300	8.5"x11"	$529	
GCC XL 608	600x600	11"x17"	$2189	SALE
GCC XL 808	800x800	11"x17"	$2719	SALE

Graphics Tablets

Wacom SD-420E 12"x12" Tablet $487!

- 1016 lpi resolution
- Pressure-sensitive stylus with no cord or batteries!
- Perfect for photo retouching and animation

Model	Size	Price	
Wacom ArtZ	6" x 8"	$279	
Wacom SD-420E	12" x 12"	$487	SALE
Wacom SD-310E	12" x 18"	$699	
Wacom UD-1825	18" x 25"	$1999	
Calcomp Drawing Slate II	12" x 12"	$249	

Purchase $400 or more and get the full bundled version of Adobe Photoshop 3.0.1 for only $299

Monitors

Sony 17SF/ Radius Thunder 24 $1479!

Save $200 on a Sony 17SF monitor and Radius Thunder 24 Series IV complete video solution!

- Accurate, 24-bit color
- 1024 x 768 resolution
- Photoshop acceleration

Monitor	Resolution	Price	
Sony 1425	14in, 25mm, 1024x768	$321	
Sony 15SF	15in, 25mm, 1024x768	$439	
Sony 17SF	17in, 25mm, 1024x768	$879	SALE
Sony 20SE	20in, 25mm, 1280x1024	$1889	
NEC 17XE	17in, 25mm, 1280x1024	$979	
Apple 15	15in, 25mm, 1024x768	$459	
Apple 17	17in, 1024x768, .26mm	$859	

Fax Modems

Low Price

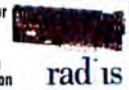
dsc Turbo FaxModem $98!

- 14,400 bps data transmission rate
- 100% AT&T compatible
- Free fax software included!

Model	Description	Price	
dsc Turbo FaxModem	External, 14,4K bps	$98	SALE
US Robotics Sportster 28.8 V.34	External, 28.8K bps	$248	
SupraFAXModem 28.8 MC V.34	External, 28.8K bps	$225	
GlobalVillage TelePort Gold II	External, 14,4K bps	$123	
GlobalVillage TelePort Platinum	External, 28.8K bps	$226	SALE

Video Cards

Radius Thunder 24 $799!



- 24-bit color at 1152 x 870 dpi!
- Photoshop acceleration

radius

Video Cards	Resolution	Price	
Radius Spectrum 24 Series V	1024x768	$399	
Radius Thunder 24	1152x870	$799	SALE
Radius Spectrum Power, 1152	1152x870	$1138	
Radius Thunder II Series IV GX 1152	1152x870	$1939	
Radius Thunder II Series IV GX 1360	1360x1024	$2389	
Radius Thunder II Series IV GX 1600	1600x1200	$2869	SALE

SyQuest Cartridges

Original SyQuest 88MB $45!

LOW Prices

Cartridges		Price
270MB Cartridges	(10 + or with drive purchase)	$56
200MB Cartridges	(10 + or with drive purchase)	$70
105MB Cartridges	(10 + or with drive purchase)	$50
88MB Cartridges	(10 + or with drive purchase)	**$38 /45** SALE
44MB Cartridges	(10 + or with drive purchase)	**$33 /39** SALE

Optical Cartridges

3.5" Optical	Price	
Sony 128MB	$29	
dsc 128MB	**$17**	SALE
dsc 230MB	$32	
Komag 128MB	$24	
Komag 230	$28	
Sony 230	$39	

5.25" Optical	Price
Sony 650MB	$75
3m 650MB	$75
dsc 650MB	$64
Komag 650	$69
Tahiti II 1GB	$159
Komag 1.0GB	$81
dsc 1.3GB	$79
Komag 1.3GB	**$83** SALE
Sony 1.3GB	$95

Tapes

Cartridges	Price	
Sony DAT 90m	$12	
Sony DAT 120m	**$24**	SALE
Maxell 8mm 112m	$21	
Sony 6250	$25	
Sony 6525	$29	

Save on Komag Optical Cartridges!

Get high performance, quality and cost effective storage from the world's leader in storage technology—Komag!

Komag 1.3GB Cartridges $83!

Now in 230MB!

5.25"	Price	
600/650MB	$69	
1.0GB	$81	
1.2/1.3GB	**$83**	SALE

3.5"	Price	
128MB	$24	SALE
230MB	$28	

- Compatible with all magneto optical drives
- Made in the USA
- Every cartridge fully tested and certified
- LIFETIME Warranty

Hard Drives

NEW!

FWB Hard Disk Toolkit. $59 Value!

dsc Turbo Drives Now even faster! Turbo models have guaranteed 72-hour replacement *plus* FWB Hard Disk Toolkit—*FREE!*

Turbo Quantum 2.1GB $974!

Quantum — Quantum Warranty: 2 to 5 Years

Model	Access	Internal	External	dsc Turbo	
85MB Go	Daytona	17ms	$199	$319	$344
256MB Go	Daytona	17ms	$239	$359	$384
341MB Go	Daytona	17ms	$289	$409	$434
512MB Go	Daytona	17ms	$389	$509	$534
42MB	Maverick	17ms	$79	$139	$164
85MB	**Maverick**	**17ms**	**$110**	**$170**	**$195** SALE
270MB	Maverick	14ms	$150	$210	$235
365MB	Lightning	11ms	$175	$235	$260
540MB	Maverick	14ms	$215	$275	$300
540MB	Lightning	11ms	$225	$285	$310
730MB	Lightning	11ms	$255	$315	$340
1.0GB	Empire	9.5ms	$509	$569	$594
1.4GB	Empire	9.5ms	$659	$719	$744
2.1GB	**Atlas**	**9.5ms**	**$889**	**$949**	**$974** SALE
4.2GB	Atlas	9.5ms	$1489	$1549	$1574

Seagate — Seagate Warranty: 5 Years

Model	Access	Internal	External	dsc Turbo	
1.0GB	Hawk 1	9ms	$519	$579	$629
2.1GB	Hawk 2LP	9ms	$949	$1009	$1059
2.1GB	Barracuda 2LP	8ms	$1049	$1109	$1159
2.1GB	Barracuda 2W*	8ms	$1129	$1189	$1239
4.3GB	**Hawk 4LP**	**9ms**	**$1329**	**$1389**	**$1439** SALE
4.3GB	Barracuda 4LP	8ms	$1479	$1539	$1589
4.3GB	Barracuda 4W*	8ms	$1579	$1639	$1689
3.4GB	Elite 3	10ms	$1935	$2035	$2085
9.1GB	**Elite 9**	**11ms**	**$2989**	**$3089**	**$3139** SALE

IBM — IBM Warranty: 5 Years

Access	Internal	External	dsc Turbo	
12ms	$140	$200	$225	
12ms	$169	$229	$254	
12ms	$199	$259	$284	
11ms	**$229**	**$289**	**$314**	SALE
11ms	$499	$559	$584	
11ms	N/A	$799	$824	

LOW Prices

Fujitsu — Fujitsu Warranty: 5 Years

Access	Internal	External	dsc Turbo	
9ms	**$209**	**$269**	**$294**	SALE
9ms	$519	$579	$604	
9ms	$939	$999	$1024	

For Active Termination, add $29. Additional 50/50 SCSI cables, $15 each.

Includes external drive, 25/50 SCSI Cable, MAC SW and terminator. Turbo models include FWB Hard Disk ToolKit and 72-hour warranty repair.

** Fast/Wide drives require ATTO SE IV SCSI interface card at $895*

SyQuest 270MB $435!

- High speed—13ms access time!
- Compact 3.5" format
- Compatible with SyQuest 105 cartridges
- Meets the speed and capacity requirements of image processing and publishing professionals

SyQuest Drives

dsc Turbo-charged SyQuest Drives!

Model	Internal	External	dsc Turbo	
SyQuest 270	**$370**	**$410**	**$435**	SALE
SyQuest 200	**$355**	**$395**	**$420**	SALE
SyQuest 105	$190	$230	$255	
SyQuest 88C	$260	$300	$325	
SyQuest 44	$130	$160	$185	

Includes external drive, 25/50 SCSI Cable, MAC SW and terminator. Turbo model includes FWB Hard Disk ToolKit and 72-hour warranty repair.

Sony SDT-5000 $1019!

Tape Drives

- Built in data compression
- 16GB per 120 meter tape
- Low cost, dependable backup

FREE! 72 hour Replacement Guarantee with any tape drive purchase!

Model	Capacity	Size	MacKit	dsc Turbo	
Sony SDT-2000	2GB	3.5"HH	$725	$775	
Sony SDT-4000	8GB	3.5"HH	$935	$985	
Sony SDT-5000	**5-16GB**	**3.5"HH**	**$969**	**$1019**	SALE
Exabyte 8200	2GB	5.25"FH	$1275	$1350	
Exabyte 8500	5GB	5.25"FH	$2175	$2250	
Exabyte 8205	**2-5GB**	**5.25"HH**	**$1479**	**$1529**	SALE
Exabyte 8505XL	5-10GB	5.25"HH	$2189	$2239	

Includes external drive, 25/50 SCSI Cable, MAC SW and terminator. Turbo model includes Retrospect and 72-hour warranty repair.

Multifunctional Drives

SyQuest 200 /540MB HD Combo $669!

- Up to 6 devices in the same enclosure!
- Costs less than individual drives
- Quick setup. Only one cable!
- Promotes data security. Just lock it away after hours.

Multifunctional	Price	
SyQuest 200 /540MB hard drive	**$669**	SALE
Sony SDT 5000 /2.0GB Quantum	$1899	
Sony 650MB Optical /SyQuest 200	$1199	
Olympus 3.5" optical /Nikon Coolscan	$1899	
SyQuest 88c /650MB optical drive	**$1099**	SALE
SyQuest 88c /NEC 3X CD ROM /540MB HD	$979	
128MB optical drive /540MB hard	$699	
NEC 3X CD-ROM /1.3GB optical drive	$1999	
4.0GB Seagate HD /Nikon CoolScan	$2999	

Includes external drive, 25/50 SCSI Cable, terminator, Mac SW and 72-hour warranty repair.

Optical Drives

Sony 1.3GB $1699!

- High 2.0MB p/s transfer rate
- Economical storage of large color images and digital audio/video data
- Durable cartridges keep data safe for up to 30 years!

5.25" Drives	Capacity	Seek	MacKit	dsc Turbo	
Sony 650	650MB	19ms	$999	$1049	
Sony 1.3GB	**1.3GB**	**25ms**	**$1699**	**$1749**	SALE
MaxOptix-Tahiti II	1.0GB	25ms	$1299	$1349	
MaxOptix-Tahiti III	1.3GB	25ms	$1989	$2039	
PMO-1.3GB	1.3GB	19ms	$2379	$2429	

Olympus 128MB $389!

- Convenient 3.5" format
- Optical technology for years of reliable storage

3.5" Drives	Capacity	Seek	MacKit	dsc Turbo	
Olympus 128	**128MB**	**35ms**	**$389**	**$439**	SALE
Fujitsu-230	230MB	30ms	$639	$689	
Most-256	256mb	37ms	$895	$945	

Includes external drive, 25/50 SCSI Cable, MAC SW and terminator. Turbo model includes FWB Hard Disk ToolKit and 72-hour warranty repair.

Toshiba 3501 $425!

CD-ROM Drives

TOSHIBA

- Quad speed
- Supports PhotoCD, Multisession and MPC
- Includes FWB CD ToolKit FREE!

Model	Price	
Toshiba 3501 QuadSpeed	**$425**	SALE
NEC MultiSpin 2V	$189	
NEC MultiSpin 4XI	**$369**	SALE
NEC MultiSpin 4Xe	$459	
CD-ROM Special (with CD-ROM drive purchase)	$79	

CD ROM Recorders

PM CDR-1000 $1799!

Model	Price	
PinnacleMicro CDR-1000	**$1799**	SALE
Yamaha 4-Speed CD-ROM Recorder	$3369	

Disk Arrays

dsc 4.0GB Array $2569!

- Supports Raid Levels 0 and 1 for disk mirroring and striping
- Speeds up all applications—including VideoVision Studio!

Model	Description	Array	VideoVision	
dsc 2.0GB Array	(2 x 1.0GB drives)	$1319	N/A	
dsc 4.0GB Array	**(2 x 2.0GB drives)**	**$2569**	**$2899***	SALE
dsc 8.0GB Array	**(2 x 4.0GB drives)**	**$2999**	**$3699***	SALE
dsc CD-ROM Array	**(2 x Toshiba 3501)**	**$999**	**N/A**	

Includes external disk array, SCSI Cable, MAC SW and terminator.
**VideoVision Studio support requires ATTO Fast/Wide interface; add $895*

800-352-3413

OPEN EVERY DAY: WEEKDAYS 6:00AM TO 8:00PM, WEEKENDS 9:00AM TO 4:00PM.

SuperMicro $100,000 Lease Credit

72 Hour Retrospect Backup — LOW Prices

Circle 126 on reader service card

SuperMicro

Image Processing Specialists

385 Van Ness Ave. #110
Torrance, CA 90501

310-782-5760 International
310-782-5974 Fax

Best Technical Support

1994 Consultants Choice Awards Macintosh Consultants Network

Great Products. Priceless Support!

Get 1+ gigabytes $549.95 Internal configuration

APS ST 1.0

- ✓ Over 1GB formatted capacity
- ✓ Perfect combination of capacity and performance
- ✓ 800,000 hour MTBF and five-year warranty are your promise of reliability and longevity

Macworld 1994 World-Class Awards:
★ Best Customer Service
★ Best Storage
★ Best Tape Storage

Macworld 1993 World-Class Award:
★ Best Storage

Consultants Choice Award 1994:
★ Best Technical Support

MacUser Editor's Choice Award 1993:
★ Best New Storage Product

APS Q 730
$259.95 *Internal configuration*

APS Q 365
$179.95 *Internal configuration*

APS MS 9.0
$2299.95 *Internal configuration*

APS Q 365 / Q 730
- ✓ Today's best value for data intensive storage needs
- ✓ Formatted capacity up to 700MB
- ✓ 2-year warranty for high product reliability

APS MS 9.0
- ✓ Transfer rates as high as 3.69MB per minute gives you the performance you need
- ✓ 5-year warranty ensures product reliability
- ✓ Formatted capacity up to 8.6GB

Call for best pricing! APS Competitive Advantage!

APS SCSI HARD DRIVES

Model	Capacity	Internal	SR2000
349-2047MB			
APS Q 365[2] Quantum 365 Lightning	349MB	$179.95	$279.95
APS Q 730[2] Quantum 730 Lightning	699MB	259.95	359.95
APS ST 1.0[5] Seagate ST 31230N Hawk	1010MB	549.95	649.95
APS Q 1.0[5] Quantum Atlas XP31070	1025MB	699.95	799.95
APS Q 2.0[5] Quantum Atlas XP32150	2050MB	999.95	1099.95
APS MS 2.0[5] Micropolis 4221	1955MB	999.95	1099.95
APS MS 2.0AV[5] Micropolis 4221AV	1955MB	1099.95	1199.95
APS ST 2.0[5] Seagate ST 32550N Barracuda	2047MB	1099.95	1199.95

Model	Capacity	Internal	SR2000
4064-8669MB			
APS MS 4.0[5] Micropolis 3243	4064MB	$1399.95	$1499.95
APS MS 4.0AV[5] Micropolis 3243AV	4064MB	1499.95	1599.95
APS Q 4.0[5] Quantum Atlas XP34300	4101MB	1499.95	1599.95
APS ST 4.0[5] Seagate ST 15150N	4094MB	1599.95	1699.95
APS MS 9.0[5] Micropolis 1991	8669MB	2299.95*	2499.95*
APS MS 9.0AV[5] Micropolis 1991AV	8669MB	2399.95*	2599.95*
APS ST 9.0[5] Seagate ST4108001N	8669MB	3299.95*	3499.95*

* *External case is special Full Height only*

Model	Capacity	RAID LEVEL	Price
APS DISK ARRAYS (0-1)			
ARRAID S2/5400[5]	2GB	Striped (0)	$1399.95
ARRAID S2/7200[5]	2GB	Striped (0)	1599.95
ARRAID S4/7200[5]	4GB	Striped (0)	2499.95
ARRAID S8/7200[5]	8GB	Striped (0)	3299.95
ARRAID M1/7200[5]	1GB	Mirrored (1)	1599.95
ARRAID M2/7200[5]	2GB	Mirrored (1)	2499.95

DaTerm™ patent pending
Copyright © 1995 APS Technologies
Internal drives for Quadra 800 and Centris 610 available
1-5 Denotes length of manufacturer's warranty in years
Full Height cases include SCSI Sentry FREE!

30 DAY MONEY BACK Guarantee TRY IT YOU'LL LIKE IT!

ARRAID™

ARRAID is RAID Made Easy!

ARRAID: Disk Array systems from APS are high performance, easy-to-use disk array storage solutions. ARRAID provides the power, reliability and plug-and-play convenience Macintosh users expect. Available in mirrored or striped configurations up to 16GB, with a 5-year warranty.

APS Technologies

1-800 874-1428 APS Technologies 6131 Deramus, Kansas City, MO 64120

MACWORLD SERVICE HERO

APS HyperTape $499.95

External configuration without tape!

Don't Wait! Order Now! 24 Hours a day 7 Days a Week

24 HOURS — OPEN 7 Days a Week

- ✓ Newest in quarter-inch minicartridge tape technology!
- ✓ Highest capacity, fastest tape drive under $500!
- ✓ Up to 4GB* of storage
- ✓ Transfer rates to 30MB per minute
- ✓ Includes Retrospect v2.1 software by Dantz **FREE!**

NEW FROM APS

As low as $31.95
(Sony 3080XLF)

THE APS ADVANTAGE

- 30-Day MBG
- Toll-Free Support
- Manufacturer Warranties
- Factory Direct Quality
- Rapid Repair Return
- 24-Hour Product Sales

LEGENDARY PRODUCT SUPPORT — APS TECHNOLOGIES

APS TAPE DRIVES

Model	Capacity*	Internal	External
APS HyperTape[1]	4GB†	—	$499.95
APS DAT[2]	4GB	$749.95	799.95
APS HyperDAT[1]	8GB	949.95	999.95
APS DLT20[2]	20GB‡	—	3999.95

*Actual data compression and tape capacity vary greatly depending on the type of data recorded, other system parameters and environment.
† 2:1 Software data compression. ‡ 2:1 Hardware data compression.

All APS DAT, DLT & HyperTape drives include Retrospect by Dantz

Tape Media	1-4	5-19	20+ (BEST VALUE)
3080XLF (HyperTape)	$34.95	$32.95	$31.95
60-Meter	7.95	6.95	5.95
90-Meter	9.95	8.95	7.95
120-Meter (DDS-2)	19.95	18.95	17.95
DLT Data cartridge	45.95	—	—
DLT 3PK Data cartridges	129.95	—	—

APS HyperDAT™

- ✓ Capacity up to 8GB
- ✓ Transfer rates up to 28MB per minute gives high-performance storage for high-end users
- ✓ Reliable and flexible storage compatible with DDS and DDS-DC DATs

APS HyperDAT $999.95

External configuration with tape!

World Class Winner Macworld

Macworld's 1994 World-Class Award for Alternative Storage goes to the APS line of DAT Drives

APS REMOVABLES

Model	Capacity	SR 2000
APS SQ 3270[2]	255MB	$479.95
APS SQ 5200[2]	194MB†	499.95

† Does not format 44MB & 88MB cartridges
All SyQuest drives include 1 FREE cartridge

SyQuest Media	1-4	5-9	10+ (BEST VALUE)
SQ-400 (44MB) cartridge	$44.95	$43.95	$41.95
SQ-800 (88MB) cartridge	54.95	53.95	51.95
SQ-2000 (200MB) cartridge	84.95	83.95	81.95
SQ-310 (105MB) cartridge	59.95	58.95	56.95
SQ-327 (270MB) cartridge	64.95	63.95	61.95

Prices listed are for unformatted media

- 30-day money-back guarantee • (Excluding opened software). Your risk is the cost of shipping.
- Drive-for-Drive Repair or Replacement Warranty • The warranty length is denoted by the superscripted number next to each drive model. APS will, at its discretion, replace or repair products found to be defective according to the terms of the product's warranty.
- All prices and specifications are subject to change without notice.
- Refused orders subject to restocking fee.
- Hard drives include brackets, cables, cords and LEDs required for operation with the specified Macintosh where applicable. All hard drives from APS Technologies come preformatted with Apple's System 7.0.1 software, and APS Technologies' APS POWER TOOLS SCSI formatter/hard disk partitioner.
- All external drive products and cases come with a premium 25 x 50 SCSI cable.
- International customers must pay for all shipping charges.
- Toll-free Technical Support as needed. Regular hours are 8 am to 8 pm Monday thru Friday, 9 am to 5 pm Saturday, Central Time.

APS MO DRIVES

Model	SR 2000
APS 230MB MO[1]	$599.95
APS 1.3GB MO[1]	1999.95

All MO drives include 1 FREE cartridge
1-5 Denotes length of manufacturer's warranty in years

MO Media	1-4	5-9	10+ (BEST VALUE)
128MB cartridge	$27.95	$26.95	$22.95
230MB cartridge	39.95	38.95	34.95
1.3GB cartridge	89.95	88.95	84.95

APS INTERNATIONAL
Global Storage Resource

APS Intl. Sales Line (816) 920-4109
On parle français au (816) 920-4135
Se habla español en (816) 920-4136
Si parla l'italiano in (816) 920-4137
Wir sprechen Deutsch (816) 920-4138
どうぞご遠慮なく日本語の
ファックスでもお申込み下さい。
24-Hour Intl. Fax: (816) 483-3077

International Sales

POWERBOOK DRIVES

Model	Capacity	Internal
APS T 350[1]	335MB	$299.95
APS Q 341[1]	326MB	299.95
APS Q 514[1]	491MB	399.95
APS T 504[1]	504MB	399.95
APS T 800[1]	773MB	599.95

POWERBOOK STUFF

APS SCSI DOC w/ PowerMerge Lite $39.95

Palm-Sized 25–30 PowerBook SCSI Adapter that includes a docking adapter for PowerBook and termination power indicator. Receive PowerMerge Lite Free with every APS SCSI DOC!

VISA MasterCard NOVUS — Visa, MasterCard, Discover, American Express: No Surcharge

TeleCheck — Same day shipping for personal checks (Restrictions apply)

1-800 874-1428

APS Technologies

Circle 62 on reader service card

COMPUTER DISCOUNT WAREHOUSE™

CDW® YOUR COMPLETE SOURCE FOR MACINTOSH SOFTWARE

RELISYS

Relisys AVEC 2400 MAC Designer Flatbed color scanner

The AVEC 2400 MAC Designer is an excellent choice for the small office or home office.

✔ Resolution: 600 x 300 dpi (optical), 2400 dpi (interpolated) ✔ 24-bit color or 8-bit grayscale scanning ✔ 8.5" x 14" scanning area ✔ 3-pass, cold cathode scanning ✔ Includes Kai's Power Tools SE, Adobe Photoshop LE, Omnipage Direct and Art-Scan ✔ Optional automatic document feeder ✔ SCSI-2 interface

ONLY **$444.12** CDW 51557

Lexmark Optra Lxi The ultimate LAN printing solution

LEXMARK™ Authorized Dealer

▼ 1200 dpi, 8 ppm ▼ 600 dpi, 16 ppm ▼ 8MB RAM std., 64MB max. ▼ PostScript Level 2 compliant, 39 fonts ▼ Enhanced PCL 5, 46 fonts ▼ Paper handling: Two 500 sheet paper drawers ▼ Optional duplexing upgrade ▼ 75,000 page per month duty cycle ▼ Interfaces: bidirectional parallel, Apple LocalTalk, Ethernet 10BASE-T, 2) network adapter slots ▼ 1 year LexExpress warranty

ONLY **$2998.69** CDW 46774

800-509-4CDW

Authorized Catalog Reseller

Call for your free Macintosh® catalog today! CDW® features a full line of Apple® Power Macintosh™, Performa® and PowerBook® computers and Macintosh-compatible peripherals and software.

Top-Selling Macintosh® Software

Adobe

Dimensions V2.0	124.50
Gallery Effects Vol. 1	97.66
Home Publisher V2.0	44.51
Illustrator V5.5 + CD	379.57
Pagemaker V5.0A	558.27
Persuasion V3.0	302.72
Photoshop V3.0.1	566.79
Premiere V4.0	504.15
Streamline V3.0	125.23
Super ATM	93.99
Type Basics	121.45
Type Manager V3.8	39.78
TypeSet Value Pk	39.39
Apple System 7.5 upgrade	89.95
Ares Font Hopper	39.27
Ares Fontmonger V1.5	89.58
Avery MacLabel Pro	45.75

Broderbund

Carmen Sandiego/Time	29.31
Carmen Sandiego/World DLX	39.15
Carmen Sandiego/World DLX CD-ROM	43.10
MYST CD-ROM	47.47
Prince of Persia	29.24
The Printshop Deluxe V1.1	46.64
Typestyler V2.0	118.43
BestWare MYOB Accounting V5.0	119.61
Caere OmniScan	295.50

Claris

Claris Draw V1.0	245.51
ClarisWorks V3.0	117.56
ClarisWorks V3.0 CPU Bundle	64.07
FileMaker Pro V2.1	89.99
FileMaker Pro V2.1 comp upg	111.07
Impact V1.0	136.26

Connectix

Desktop Utilities	55.85
PowerBook Utilities	55.20
RAM Doubler V1.5	54.32
CA Cricket Graph III V1.5	65.28
Caere OmniPage Direct V2.0	58.06
Caere OmniPage V5.0	297.17
Casady & Greene Conflict Catcher III	59.18
Corel Gallery V1.0	32.62

HSC Live Picture V2.0

ONLY **$635.81** 53229

Dantz

Diskfit Direct V1.0	29.60
Diskfit Pro V1.1	69.31
Retrospect V2.1	135.59

Delrina

DelrinaFax PRO V1.5.1	52.78
Fax PRO V1.5.1 CPU Bundle	24.16
Opus & Bill Screen Svr	29.48
Dataviz MacLink+/PC Connection	114.53
Datawatch Virex V5.5	59.40
DCA CrossTalk	112.53
Delta Point DeltaGraph Pro V3.0	125.29
Deneba Canvas V3.5 + CD	254.01
Deneba Canvas Power Graphics Bundle	283.29

Entertainment

Berkeley After Dark V3.0	29.48
Berkeley Disney Screen Svr	27.79
Berkeley Star Trek Screen Svr	28.21
Electronic Arts Chuck Yeager	35.60
Electronic Arts PGA Tour Golf II CD	36.26
LucasArts Loom	17.93
LucasArts Secret of Monkey Island	19.46
Maxis A-Train w/Contruct Set	29.00
Maxis EL Fish	6.66
Maxis SimAnt	18.38
Maxis SimCity 2000	38.97
Maxis SimCity Classic	24.07
Microprose Civilization	43.33
Paramount Jump Raven CD	38.97
Paramount Lunicus CD	38.67
Psygnosis Lemmings	34.07
Sierra Hoyle Classic	27.97
Sierra Leisure Suit Larry 5	23.76
Spectrum Holo Iron Helix CD	56.80
Spectrum Holo Super Tetris	29.30
Spectrum Holo Tetris	23.85
ST:TNG Interactive Tech Manual CD	38.73
Velocity Dev Spectre VR	34.07
Virgin 7th Guest CD	42.63

Fractal Design

Dabbler V1.0	58.73
Painter V3.0	299.98
Sketcher V1.0	48.52
Farallon Timbuktu Pro V1.0	127.02
Framemaker V4.0	539.41
Framereader	74.50
FWB Hard Disk Toolkit Personal V1.7	49.72
Gryphon Morph V2.0	139.26
Hayes Smartcom III V3.4	79.66
HSC Kai's Powertools V2.0	102.04
HSC KPT Bryce V1.0	111.42
HSC KPT Convolver V1.0	111.35
HSC Live Picture V2.0	635.81

Insignia

Soft PC V3.0	99.70
Soft PC with Windows	297.73
Soft Windows Power Mac V1.0	263.62
Solutions Pro V3.1	194.76
Inline INITpicker V3.0	44.28
Intuit Quicken V5.0	41.85
Kent Marsh Folderbolt V1.02	69.91

SPECIAL OFFER!

Delrina Fax PRO V1.5.1

When you purchase any Apple Macintosh* computer you can get Delrina Fax PRO V1.5.1 at a special price.

ONLY **$24.16*** CDW 53341 *with CPU purchase

MacPlay

Alone in the Dark	35.01
Battlechess	18.24
Flashback	37.26
Frankenstein CD	47.24
Mac Gift Pack	37.07
Mario's Game Gallery	25.31
Peter Gabriel XPLORA 1 CD	46.36
Star Trek 25th Anniversary	34.20
Wolfenstein 3D	37.19
Director Multimedia Studio Bundle	1342.39
Fontographer	308.84

Microsoft

Cinemania 1995 CD	49.42
Encarta 1995 CD	84.82
Excel V5.0	269.49
Excel V5.0 Upg	109.86
Flight Simulator V4.0	39.38
FoxPro V2.6	99.88
Office V4.2	429.89
Office V4.2 vers upgrade	254.79
PowerPoint V4.0	286.87
PowerPoint V4.0 upgrade	109.84
Project V3.0 comp upg	131.14
Project V4.0	413.52
Word V6.0	284.79
Word V6.0 vers upgrade	109.86
Works V4.0	84.74

Macromedia

Director V4.0	766.44
Freehand V5.0	372.46
Freehand V5.0 comp upgrade	148.98
Freehand V5.0 vers upgrade	148.98
Now Contact V3.0	59.73
Now Software Bundle	86.48
Now Software Now Utilities V5.0	76.91
Now Up to Date V3.0	59.86
QuarkXPress PMac V3.3.1 CD	659.06
QuarkXPress V3.3	569.50

Casady & Greene Conflict Catcher 3 V1.0

ONLY **$59.18** 53335

Ray Dream

AddDepth V1.0	98.58
Designer V3.0	223.30
JAG II	85.06

Symantec

ACT! V2.0	154.86
MacTools Pro V4.0	92.84
Norton Utilities V3.1	95.58
SAM AntiVirus V4.0	64.36
Suitcase V2.1	64.93
Software Ventures MicroPhone Pro	127.02
Bestware MYOB Accounting V5.0	72.21
TiMaker Incredible Image Pak	70.58

WordPerfect

WordPerfect V3.1	CALL!
WordPerfect V3.1upgrade	91.34

If You Find a Better Price, Call CDW® Before You Buy (800)509-4CDW

NASDAQ

BUY WITH CONFIDENCE CDW® IS A NASDAQ TRADED COMPANY
TICKER SYMBOL CDWC
D & B rated 5A1
Duns 10-762-7952

No surcharge for credit cards

Credit Card charges are not submitted until time of shipment. Freight is calculated on the carrier's actual freight charge plus insurance and packaging material. The cost of insurance is 0.35% ($3.00 minimum). All free order local packaging materials will not exceed $4.00 per 3 pack/box order or $10.00 per multi-box/pallet shipment. For your protection we ship only to your verified billing address. Non-defective returns subject to restocking fee. Allow 10 business days for shipping when paying by personal check. Software, chips and other electronic components are non returnable. All pricing subject to change. ™ - Trademarks of all companies listed in this ad.

CDW® TELEPHONE HOURS
Sales 7:00-9:00 CDT Mon-Fri.
9:00-5:00 CDT Sat.
Tech Support for Customers
8:00-7:00 CDT Mon-Fri.
9:00-5:00 CDT Sat.

Free technical support for CDW® customers

WHY PAY RETAIL? CDW® SELLS FOR LESS AND SERVICES YOU BETTER!

MacWorld 7/95

COMPUTER DISCOUNT WAREHOUSE™

CDW® YOUR COMPLETE SOURCE FOR HARDWARE & PERIPHERALS

Monitors

NEC

XV15 15" flat square	429.88
XV17 17" flat square	769.43
XE15 15" flat square	539.50
XE17 17" flat square	998.43
XE21 21" flat square	1979.74
XP15 15" flat square	579.68
XP17 17" flat square	1236.86
XP21 21" flat square	2447.49

MAGNAVOX

CM2080 14" .29mm	249.31
20CM64 20" .31mm	1069.44

SONY

CPD-1425 14" Trinitron	319.65
CPD-1425 14" Trinitron	319.65
15sf1 15" Trinitron	459.66
17sf 17" Trinitron	679.49
20se1 20" Trinitron	1895.00

Radius

PrecisionColor Display/17 17" full pg	966.84
SuperMatch 17T 17"	833.60
Intelli-Color Display 20e 20"	1673.73
Pressview 21T	3064.31
SuperMatch 21T XL	2149.63

Graphics/Video Boards

Radius

PhotoEngine	818.34
Thunder/24 GT	1349.00
Thunder IV GX 1152	1919.22
Thunder IV GX 1360	2379.96
Thunder IV GX 1600	2699.76
VideoVision Studio V2.0	3699.00

CPU Upgrades

DayStar

PowerPro 601 66MHz	1646.74
PowerPro 601 80MHz	1752.45
Turbo 601 66MHz	952.38
PowerCard 601	615.96

Newer Technology

PowerClip clock accelerator	129.95
Power MacCache 256KB	189.89
PowerClip+Power MacCache bundle	309.81

Networking

Dayna

Daynaport SCSI/Link Coax	249.95
Daynaport SCSI/Link PB-T 10BT	269.27
Daynaport SCSI/Link PB-3 Combo	295.60
Etherprint APL Bridge BNC/AUI	319.00
Etherprint-T APL Bridge RJ45/AUI	316.50
Etherprint-3 APL Bridge BNC/RJ45/AUI	355.40

FARALLON

EtherWave AAUI Transceiver 10BT	94.79
EtherWave AUI Transceiver 10BT	97.87
EtherWave LC-F Adapt. w/FPU 10BT	169.74
EtherWave NuBus Adapt. 10BT	169.74
EtherWave Adapt. (PwrBk, Classic) 10BT	228.13
EtherWave Printer Adapt. 10BT	228.13
EtherMac SCSI-TP (PowerBook) 10BT	279.74
EtherMac SE-C Combo	144.06
Ether10-T transceiver RJ45/AAUI	49.09
Ether10-T transceiver RJ45/AUI	62.61
LocalPath V1.0 8 user	129.22
PhoneNET Connector DIN-8	27.69
PhoneNET Connector DIN-8 10pk	186.23

Communications/Modems

Global Village

PowerPort Gold 14.4K	239.85
PowerPort Platinum V.34	325.96
Teleport Gold II 14.4K	124.44
Teleport Platinum V.34	227.59

Practical Peripherals

14.4 external mini-tower w/fax	104.38
28.8 V.34 external mini-tower w/fax	209.96
MacClass PCMCIA 14.4	177.14
MacClass PCMCIA 28.8	337.97

Supra

Express 14.4	97.29
144LC	129.95
288 V.34	209.80
144PB PowerBook	159.22
288PB PowerBook	286.64

US Robotics

Mac&Fax Sportster 14.4	115.37
Mac&Fax Sportster V.34	248.33

Storage Systems

Chinon CDA-535 220ms/300KB	296.34
NEC MultiSpin 2V Mac kit	193.81
NEC MultiSpin 4XE	479.85
NEC MultiSpin Mac software kit	39.99
Plextor 4Plex quad-speed Mac kit	485.81

iomega

Zip drive 100MB SCSI external	199.95
100MB Zip disk	19.95
100MB Zip disks, 3 pack	49.95
100MB Zip disks, 10 pack	149.95
Bernoulli Transportable 90MB	282.22
Bernoulli Transportable 150MB	423.31
Bernoulli Transportable 230MB	454.44
Bernoulli Insider 230MB	419.78

PLI

Infinity 88MB Syquest Ext	409.47
Infinity 105MB Syquest Ext	379.62
Infinity 270MB Syquest Ext	531.25

FUJITSU

DynaMO 230MB 3.5" mag-optical	638.44

Magnetic Media

88MB SyQuest cartridge, 5yr	49.79
105MB SyQuest cartridge, 5yr	59.20
200MB SyQuest cartridge, 5yr	79.89
270MB SyQuest cartridge, 5yr	83.57
90MB Iomega Bernoulli cart	87.55
150MB Iomega Bernoulli cart	93.33
230MB Iomega Bernoulli cart	99.81
3M 230MB 3.5" optical, Mac format	43.31

CDW carries Conner, IBM, Maxtor, Micropolis and Seagate SCSI hard drives. Call for details.

Input Devices

Microtek

35T Slide Scanner	949.26
ScanMaker II	465.93
ScanMaker IISP	499.76
ScanMaker IISP Trans Media	486.60
ScanMaker IIHR	1039.38
ScanMaker IIXE	876.11
ScanMaker Auto Doc Feeder	361.54

RELISYS

AVEC 2400 MAC Designer	444.12
Rel4816 MAC/TE	929.66
Rel4830 MAC/TE	1214.99
Rel9612 MAC/TE	1393.53
Rel9624 MAC/TE	1854.18

Wacom

4x5 ArtPad ADB, with stylus	145.00
6x8 Artz ADB, cordless pres stylus	282.32
12x12 UD-series, cordless pres stylus	489.00

Call for Wacom bundles!

Printers

EPSON

Stylus Color 720 dpi Color Ink Jet	509.53

Hewlett Packard

DeskWriter 540	289.45
DeskWriter 660C	474.59
LaserJet 5MP	1053.43
LaserJet 4M Plus	1967.13
LaserJet 4Si MX	4234.22
LaserJet 4MV	2836.09
DeskJet 1200C	1599.77

Texas Instruments

microLaser 600	854.28
microLaser Pro 600 PS23	1197.86
microLaser PowerPro 12ppm	1593.91

Power Backup

Tripp Lite

BC250	94.97
BC400	138.91
BC500 Personal	173.09
BC500 LAN	177.51
BC675 Pro	231.43

Smart Series-CALL!

Memory

Simple Technology memory upgrades

PowerBook 160 4MB	CALL!
PowerBook 160 8MB	CALL!
PowerBook 160 10MB	CALL!
PowerBook 230 4MB	CALL!
PowerBook 230 8MB	CALL!
PowerBook Duo 14MB	CALL!
PowerBook Duo 20MB	CALL!
PowerBook Duo 28MB	CALL!

CDW carries the complete Simple line-up. Call for configurations not listed here.

OL410e/PS PostScript LED page printer

OKIDATA

NOW with PostScript!

A printer as creative as you are

✔ Complete Macintosh compatibility out-of-the-box ✔ 4 ppm print speed ✔ 600 dpi class output (300 x 1200 dpi) ✔ 2MB RAM std., Adobe Memory Booster™ for 5MB effective memory in PostScript® mode, 4MB effective in HP PCL5 mode ✔ PostScript Level 2, 35 fonts; HP enhanced PCL 5, 12 fonts ✔ High-performance 16MHz MIPS 3000 RISC-based CPU for fast print job processing ✔ Reliable solid-state LED printhead, 5 year printhead warranty ✔ Low-power consumption design, EPA Energy Star compliant ✔ Apple LocalTalk, parallel and RS-232 serial interfaces, auto interface switching ✔ 100 sheet paper tray, adjustable manual feed for legal and envelopes

ONLY **$759.86** CDW 44440

V.34 is here — NEW

Global Village Communication

Global Village TelePort Platinum

★ Data: V.34 (28.8K bps) ★ Fax: 14.4K bps send and receive ★ V.42/MNP 2-4 error correction ★ V.42bis/MNP 5 data compression ★ Included software: award-winning GlobalFax™ V2.5, GlobalFax OCR, ZTerm and America Online ★ Fax/voice discrimination ★ Fax/Apple Remote Access discrimination for use with a dedicated phone line ★ 5 year warranty

ONLY **$227.59** CDW 52875

Magnavox CM2080 14" .28mm Monitor

ONLY **$249.31** CDW 38179

NEC MultiSync XP15 15" color monitor

ONLY **$579.68** CDW 46004

Adobe Pagemaker V5.0A

Adobe PageMaker V5.0A gives you absolute power to design professional printed materials. Now bundled with FREE Extensis PageTools V1.0.

ONLY **$558.27** CDW 52594

Now Bundle

Contact V3.0 & Up-to-Date V3.0

The easiest and fastest way to manage and share your contacts and schedule.

ONLY **$86.48** CDW 49260

Canvas Power Graphics Bundle

✔ *Deneba Canvas V3.5*
✔ *Pixar Typestry V2.0*
✔ *DeltaGraph Pro V3.5*

$900 retail value!

ONLY **$283.29** CDW 51570

Director Multimedia Studio

Create cross-platform multimedia productions. Includes Macromedia Director V4.0, MacroModel V1.5, SoundEdit 16 V1.0, and Adobe Premier V4.0.

ONLY **$1342.39** CDW 51665

CDW Computer Centers, Inc.
1020 E. Lake Cook Rd.
Buffalo Grove, IL 60089-1900

INTERNET: info@cdw.com

Hardware, Peripherals and Software at Discount Prices

800-509-4CDW

FAX (708) 465-6800

©1995 CDW® Computer Centers, Inc. MW1282

Free memory & peripheral installation with CPU purchase

WHY PAY RETAIL? CDW® SELLS FOR LESS AND SERVICES YOU BETTER!

Circle 2 on reader service card

MacWAREHOUSE®

Over 6,000 products for your Mac! Overnight delivery only $3.00!

Software ONE STOP CD-SHOP

Get 10 CDs for one low, low price!

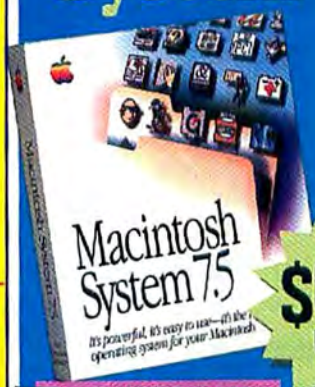
- ✓TIME's Man of the Year
- ✓Instant Calendar
- ✓Who Killed Sam Rupert?
- ✓Dinosaur Safari
- ✓Parenting
- ✓Key Gourmet
- ✓Key Clipmaster 5000
- ✓Key Fonts
- ✓Key Photo Clips
- ✓Wild Places

all for only **$29.95***

*Shipped in promotional packaging.

Ask for item # BBD 0177

Macintosh System 7.5



Publisher: Apple Computer, Inc.

$99

Update to System 7.5 today and get a FREE Apple Watch* Ask for item # AAA 0143

With purchase of any System 7.5. Limit one per customer. Valid only in the U.S. Offer expires 7/31/95 or while supplies last. Call for details.

Now has 50 powerful enhancements to power up your Mac including Enhanced Finder, increased cross-platform capabilities, automation of complex tasks and much more!

Ask for item # SYS 0022 (3.5") or SYS 0023 (CD-ROM)

DOUBLE YOUR MAC's MEMORY!

Doubles your Mac's memory without additional memory boards!

for Only **$55!**

Publisher: Connectix

Ask for item # UTI 0486

UPGRADE NOW!

Microsoft OFFICE 4.2.1

Upgrade only **$239***

PLUS get **FREE!** OFFICE FUN PACK™ when you purchase full version or upgrade

Includes these 5 great titles on one CD-ROM! VETTEL, Maniac Sports, The ChessMaster 3000, WORDTRIS, U.S. Atlas

Microsoft Office 4.2.1 Upgrade
Ask for item # BND 0605 ..... $239*

Microsoft Office 4.2.1 Full Version
Ask for item # BND 0604 ..... $475

*Price reflects $40 rebate direct from Microsoft. Price before rebate is $279. Offer expires 8/31/95. Proof of ownership required. Call for details. **Games shipped in promotional packaging. Fun Pack requires CD-ROM drive.

Microsoft Word 6.0.1 Upgrade

Loaded with new features, Word 6.0.1 makes it easy to create and format all kinds of documents.

Upgrade UPG 0155 ..... $89*

Full Version WRD 0098 ..... $295

Publisher: Microsoft

*Price reflects $30 rebate direct from the manufacturer. Price before rebate is $119. Upgrade rebate expires 8/31/95. Proof of purchase is required. Call for details.

Ultra-compact, 100MB removable Iomega Zip Drive!

Stores 100MB on one 3.5" cartridge! Ultra-compact size transports easily!

Only **$199.95!**

Driver software included on first 100MB cartridge!

Ask for item # DRI 1050

Extra 100MB Removable Disks: MED 0165		
1-4	5-9	10+
$19.95 ea.	$17.95 ea.	$14.95 ea.

Design CAD 2D/3D

Full 2D drafting and 3D modeling!

Ask for item # CAD 0043

$155!

Publisher: American Small Business

3 Exciting Games From Axis!

for only **$29.95** each

Macao
Fast action strategy game.
Ask for item # ENT 0785

Cryptic
A mind bending logic game.
Ask for item # ENT 0786

Hex Ya!
Concentration meets minefield.
Ask for item # ENT 0787

Picture Atlas of the World

This exciting interactive CD-ROM atlas teaches both physical and cultural geography.

Also available: Mammals: A Multimedia Encyclopedia(CD-ROM) Ask for item # EDU 0513 only..... $59.95

only **$69.95**

Ask for item # EDU 1131

Mac/Windows compatible!

Publisher: National Geographic

Upgrade to FREEHAND 5.0

FOR ONLY **$149***

Ask for item # UPG 0143

*Upgrade from 4.0 or earlier. Proof of ownership required. Serial number required for installation. Call for details.

Publisher: Macromedia

The Ultimate Desktop Publishing Bundle!

Over 23,500 images and typefaces all for only **$49.95***

Ask for Item# BND 0483

This unbelievable CD-ROM bundle includes: Corel Gallery, Corel Professional Photo Sampler, PhotoLibrary, Media Clip's WorldView, Key ClipMaster Professional, Paintbrush ClipArt Library & Key Fonts Professional!

*Shipped in promotional packaging.

Order toll-free 24 hours a day, 7 days a week! 1-800-255-6227

The MacSuperStore™

Authorized Apple® Reseller

TaskForce

CLIP ART FOR MACINTOSH

1,000 IMAGES

CD-ROM & diskettes included.

Ask for item # GRA 0978

ONLY $54

Publisher: New Vision Technology

QuarkXPress 3.31

Powerful new version!

FOR AS LOW AS $589

QuarkXPress for Power Mac
Ask for item # DTP 0122 $659.95
Comes on CD-ROM–no disks included.

QuarkXPress 3.31
Ask for item # DTP 0110
Only $589

Now, get a new Power User 2X *Blazing Fast* CD-ROM DRIVE

exclusively from MacWAREHOUSE for only

$149!

LOWEST PRICE EVER!

PLUS

Ask for Item# BND 0659

Get the NEW! 1995 Grolier Multimedia Encyclopedia on CD-ROM!

AS LOW AS $49.95*

POWER USER Double-Speed Multi-session CD-ROM Drive Kit
BND 0659 ..... $149

The 1995 Grolier Multimedia Encyclopedia
EDU 1186 ..... $59.95

The 1995 Grolier Multimedia Encyclopedia with The Animals! 2.0 and Atlas Pack FREE
BBD 0162 ..... $49.95*

*with the purchase of a CD-ROM drive from Mac, Micro or CD-ROM Warehouse within the last 90 days.

PLUS 2 BONUS CD-ROMs!

THE ANIMALS! 2.0 & ATLAS PACK

*With purchase of a CD-ROM drive. Products shipped in promotional packaging.

ORDERING INFORMATION

To order, call toll-free

1-800-255-6227

(1-800-ALL-MACS)

Call 24 hours a day, 7 days a week.

Inquiries: 908-367-0440 FAX Your Order to: 908-905-9279

Compuserve Code: GOMW

NEW! Express Customer Service Number:

1-800-925-6227

MacWAREHOUSE
1720 Oak Street • P.O. Box 3031 • Lakewood, NJ 08701

©1995 Micro Warehouse Inc.

- All major credit cards accepted. No surcharge.
- Your credit card will not be charged until your order is shipped.
- If we ship a partial order, we pay the freight on the remaining portion.
- All U.S. shipments are insured at no extra charge.
- C.O.D. orders accepted (add $6.00 including shipping)-$1,000 maximum.
- All products are covered by a 120-day limited warranty. Defective software replaced immediately. Hardware replaced or repaired at our discretion.
- Some products may have system requirements. Call for details.
- **Sales tax:** CT residents add 6%, NJ residents add 7%, Ohio residents add applicable tax.

SHIPPING

- All orders add $3.00 per order. We ship Airborne Express overnight unless UPS Ground delivers overnight. (Some rural areas require an extra day.)
- Orders placed by 12:00 MIDNIGHT (EST) (weekdays) for "in-stock" items ship same day (barring system failure, etc.) for overnight delivery.
- C.O.D. orders ship via UPS (Blue Label if you are more than 2 days from us via UPS Ground). Charge is $6.00 including shipping.
- Alaska, Hawaii, outside continental U.S., APO/FPO call 908-367-0440 for information. Some products are not available outside the U.S.
- We regret that we cannot be responsible for typographical errors.
- For faster service for existing customers, our computers recognize incoming calls by the telephone number and instantly locate your records.

©Copyright 1995 MicroWarehouse, Inc. MacWAREHOUSE® is a division of MicroWarehouse, Inc. MacWAREHOUSE® and MicroWarehouse® are registered servicemarks of MicroWarehouse, Inc. Item availability and price subject to change without notice. Apple, the Apple logo, Mac and Macintosh are registered trademarks of Apple Computer, Inc.

Circle 150 on reader service card

2 FREE BONUSES!

1 **The Power User's Tool Kit** ... a collection of powerful programs compiled exclusively for MacWAREHOUSE customers. Some of the programs are shareware, so you can try them free of charge—some authors ask that you pay a small fee ($8-$25). Most programs, though, are ***absolutely* FREE**. The *Power User's Tool Kit* is ***FREE when you order from MacWAREHOUSE.*** You pay only $2.00 shipping and handling. ***Ask for Item # AAA 0141.*** All programs work with System 7. Check the box below if you would like to order the Power User's Tool Kit.

FREE!

2 **Full-Year Subscription**... to your choice of MacWAREHOUSE, MicroWAREHOUSE, Data CommWAREHOUSE (networking products), or CD-ROM WAREHOUSE catalog. Just fill in and mail the coupon below. We'll start your free subscription to the catalog with the next issue. Check the box below for your free subscription.

FREE CATALOG SUBSCRIPTION **MW0795**

Check the appropriate box(es) to receive your FREE 1-year subscription and mail this coupon to:
1720 Oak Street, P.O. Box 3031, Lakewood, NJ 08701

Name

Address Apt.

City State Zip

(Expect to receive your first issue within 4-6 weeks).

☐ *Yes,* send me my FREE Power User's Tool Kit.
Enclosed is my check for $2.00 to cover shipping and handling.

☐ MacWAREHOUSE®

☐ MicroWAREHOUSE®

☐ Data Comm WAREHOUSE™ ☐ CD-ROM WAREHOUSE™

Serving you since 1985

Best Deals
800-990-5696
Free catalog

230MB Optical.....$399
With purchase of 10 cartridges.

28.8 v.34 Modem ...$139
With software & cable.

Apple 15".....$469
For budget desktop publishing.

NEW PRICE $

UMAX
The Magic of Color

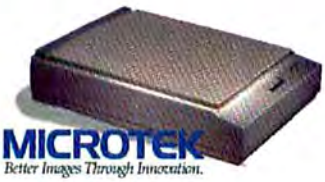
Business Card Reader	219
Vista T630	499
Vista S6	599
Vista S8	729
UC1260	819
PowerLook	2199
Transparency Adapter	399

Business Card Reader $219

Wacom

ArtZ	289
ArtPad	148
UD 12x12 RM	509
Painter Bundle	299

Painter Bundle $299



MICROTEK
Better Images Through Innovation.

Scanmaker II	469
Scanmaker IIhr	829
Scanmaker IIsp	535
Scanmaker III	2489
III Transparency Adapter	136
35T Slide Scanner	953
45T Slide Scanner	4999

Scanmaker II $469

POWER CLOCK
PowerMac ACCELERATOR
BEST PRICE $

Attention Power Macintosh Owners!
PowerClock™ accelerates CPU performance by 40%. User installable in seconds. Clips in place. Total compatibility. 30 Day MBG.

PowerMac 6100 to 84MHz	119
PowerMac 7100 to 84MHz	119
PowerMac 8100 to 126MHz	169
Power Clock Level II Cache	169

Now includes Software FPU

DGR Ext Keyboard

$59

105 key full featured extended keyboard for Macintosh. Fully ADB compatible.

DGR Technologies

NEW PRICE $

Apple Systems

Call for latest prices!

6100/66 8/350	1599
6100/66 8/350/CD	1799
6100/66 16/500/CD/DOS	2469
7100/80 8/500	2529
7100/80 8/700/CD	2859
7100/80av 16/700/CD	3399
8100/100 8/700	3199
8100/100 16/1000/CD	3999
8100/100av 16/1000/CD	4199
8100/110 16/2000/CD	5559
Powerbook 540c	2999
Quadra 630	999
Powerbook 150	959
Performa Series	Call

PowerBook Upgrades

160 to 180	399
145 to 170	129
140 to 180	399
140 to 170	299
Laserwriter Select 360	1299
Apple 15" Monitor	469

Favorite Products

Adobe Illustrator 5.5	408
Adobe Pagemaker 5.0	499
Adobe Persuasion 3.0	349
Adobe Photoshop 3.0	539
Agfa Arcus II	2599
Agfa StudioScan II	865
Castle Wolfenstein	38
Delrina FaxPro 1.5.1	39
Filemaker Pro 2.1	99
Freehand 5.0 PPC	390
Kensington ThinkingMouse	95
Kensington TurboMouse	99
Macromedia Director	799
Macromedia Freehand	389
Magic 10baseT Trnscvr	39
Magic 14.4 Data/Fax	99
Magic 28.8	119
Marathon 3D	39

Magic Memory

4MB 72pin	139
8MB 72pin	279
16MB 72pin	499
32MB 72pin	999
256K Cache	149

Nomai

BEST PRICE $

Media for SyQuest

44MB Removable Cart	34
88MB Removable Cart	39

GCC

GCC TECHNOLOGIES

NEW Elite XL808	3190
Elite 600	1399
Elite XL608	2499
600 Pro	3799

Daystar

BEST PRICE $

40MHz Turbo 040	775
66MHz PowerPro	965
100MHz PowerPro	1649

BOTTOM LINE 24-HOUR INTERNATIONAL SALES FAX (512) 892-4455

Subscribe to our Internet Specials: Mail to online@dgr.com with "subscribe specials" in subject

Bottom Line Distribution is committed to the needs of the international Macintosh user and reseller. We offer discounted rates with DHL, UPS International and Airborne Express. Delivery times to most countries is 2 to 3 days. We stock 220v versions of most hardware. Dealer inquiries are welcome. Language interpreters are available. Se hacen pedidos internacionales. Nous acceptons des commandes internationales. Internationale Handlerkonditionen

DHL AIRBORNE EXPRESS

BL

Domestic: sales@dgr.com
Int'l: world@dgr.com
Surf over to http://www.dgr.com/ and win a new Mac computer!

1-512-892-4070 4544 S. Lamar Blvd., Suite 100 • Austin, TX 78745

PowerMac 8100/110 16/2000/CD **$5559**

PowerMac 8100/100av 16/1000/CD **$4199**

Apple 17" **$929**

QuarkXPress 3.31 **$549**

Online Catalog http://www.dgr.com/

NEW PRICE $

Iomega ZIP Drive

ZIP 100MB	189
ZIP Disk	19
3-Pack ZIP Disks	48
10-Pack ZIP Disks	143

iomega.

ZIP 100MB $189

GLOBAL VILLAGE COMMUNICATION

Teleport Platinum	225
Teleport Mercury	269
Teleport Gold II	125
Powerport Gold	239
Powerport Mercury	312
Powerport Mercury PB500	341
Powerport Duo Mercury	319

Teleport Platinum $225

radius

PrecisionColor Pro 24X	575
VideoVision Studio 2.0	3449
Photo Engine	799
IntelliColor 20e	1875
Thunder IVGX 1600	2799
Thunder IVGX 1360	2359
Thunder IVGX 1152	1899

PressView 2102 $2999

Hewlett Packard

BEST PRICE $

DeskWriter 320	343
DeskWriter 560c	479
LaserJet 4ML w/toner	1029
LaserJet 5MP	1120
LaserJet 4MV(after rebate)	2749
Hp II CX Scanner	919
Color LaserJet	5899

DeskWriter 560c $479

Favorite Products

Myst	49
MS Office 4.2 w/RAM Dblr	475
MS Word 6.0.1	329
Nikon CoolScan	1360
Nikon Scantouch	1145
Optical Cart 128	25
Optical Cart 256	35
Polaroid SprintScan	1999
QuarkXPress 3.31	549
QuarkXPress 3.31 PPC	629
RasterOps Targa 2000	4599
Retrospect 2.1	139
Supra v.34	218
Supra v.34 PowerBook	309
SyQuest 88MB Cart	49
SyQuest 200MB Cart	79
SyQuest 270MB Cart	63
Warlords II	45

NEW PRICE $

Magic Products

Magic Quantum

Daytona 256 17ms	262
Daytona 514 17ms	459
Maverick 540 14ms	248
Lightning 730 11ms	290
Empire 1080 9.5ms	599
Empire 2100 9.5ms	999
Seagate Hawk 4300 9ms	1599

Magic SyQuest

270 MB Drive/Cart	399/63
200 MB Drive/Cart	419/79
44MB/88MB Cart	43/49

Magic Optical

Olympus 128/Cart	349/25
230MB Optical/Cart	Call/29
1.3 GB/Cart	1699/89

Magic Specialties

2GB RAID	1999
4GB RAID	2500
2GB Tape w/Retrospect	675
Magic CD Pro 3601 4.4X	435

Magic

microWriter PS23	625
microLaser 600	853
microLaser Pro PS23	1195
microLaser PowerPro	1635

DiiMO

DiiMOCache '040 50MHz Accelerator with 128K cache for Quadra and Centris **$799**

Macromedia

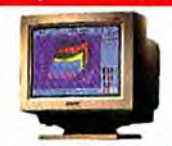
BEST PRICE $

Freehand 5.0	389
Director	799

JetInc. Inkjet Refill

2pk Blk/Color	15.99/9.99
2pk High Capacity Blk	19.99
500/50/60c/310 8pk	55.95
Color StyleWriter 1pk Blk	5.95

Sony Monitors



Sony 17SF	929
Sony 15SF	474

Payment: Visa, Mastercard, Discover & American Express. No surcharge on credit card orders. Tax: Texas residents add 8% sales tax. Prices: Items and prices subject to change and availability. Terms: Net 30 available. Purchase orders welcome. Shipping: minimum $5-UPS Ground, Blue, Red, & Airborne. Returns: All returns must be in original condition and packaging and require an RMA number. Seal must not be opened on software. Returns may be subject to a restocking fee. Original shipping is non-refundable. Bottom Line Distribution cannot be responsible for errors in typography or photography. All brands and product names are trade marks of their respective holders. Local number: 512-892-4070. Customer service 512-892-4090. 24-hour order fax line.

Open Mon-Fri 9 am - 9 pm. Sat 9 am - 4 pm.

VISA

BOTTOM LINE DISTRIBUTION

We build systems! Call for all your Macintosh needs.

1-800-990-5696 US and Canada

Fax: 1-512-892-4455

7/95 MW

Circle 63 on reader service card

THE MAC SOLUTIONS HOUSE

Configure Your Own System Package or Choose A Bundle Below

DISCOUNT WAREHOUSE

0 DOWN
Self Employed and New & Established Business Leasing

NEW!

Power Mac 8100/100 SuperSystem

- Power Macintosh 8100/100MHz w/ 40MB RAM, 1 GB Hard Drive, CD ROM Drive,16-Bit Sound) • Sony 20" Multi-Res Trinitron Monitor
- Epson ES 1200C 30-Bit Color Scanner • NEW! HP 4MV Laser Printer
- PhotoShop 3.0 • Keyboard • Claris Organizer, ABC Bundle & Cables

FREE! CLARIS ORGANIZER with All System Purchases!

7100/80 Publishing System $189 p/m*

- PowerMac 7100/80 40/1GB/CD • SuperMac 17" Trinitron Monitor
- TI 600dpi Laser • Microtek IISPX Scanner w/PhotoShop, OCR
- Extended Keyboard, Mouse & Cables

NEW! Power Mac 6100/66 8/350 HD/CD ROM w/14" Color Monitor, Extended Keyboard, Mouse, Claris Organizer ..$2195/$57 p/m

NEW! Power Mac 7100/80 8/700 HD/CD $2795**

NEW! Power Mac 6100/66 8/350 HD/CD $1785**

**price when purchased with our monitor and keyboard

FREE Color Inkjet Printer w/Every Lease Over $10,000!

COMPARE OUR DRIVE PRICES w/Our COMPETITORS!

350MB Hard Drive.....Int $179 / Ext $255
730MB Hard Drive.....Int $284 / Ext $359
200MB Syquest w/Cartridge..$495/88MB Model..$389

NEW HIGH END PERIPHERALS!

SCANMATE Drum Scanner w/ColorQuartet CMYK...$13,395/$343 p/m
EASYCOLOR 24 1360 High Speed Accelerated Graphics Board.....$1425
SHINKO 24Bit Color DYE SUB Printer w/Open Architec..$6895/$177 p/m
MAXCONCEPT 4 GigaByte Fast Wide RAID System.....$4599/$118 p/m

SCANNERS, MONITORS, PRINTERS, etc.

MICROTEK ScanMaker III 36-Bit Scanner w/FullPhotoShop $2299
MICROTEK ScanMaker II 24-Bit Scanner (600dpi) $450
TRINITRON 20" Multi-Res Monitor $1495
RADIUS VideoVision Studio 2.0 (PowerMac/Mac) $3395
TEXAS INSTRUMENTS MicroWriter 23 LASER PRINTER $649
MEDIAVISION PORTABLE CD ROM BUNDLE.....$349

More Than 10 Years Computer Experience

CALL ABOUT OUR CD RENTAL CLUB!

NEW! POWERBOOK 540c Power Package!

THE ULTIMATE, TOP OF THE LINE POWERBOOK POWERBUNDLE AT AN AMAZING PRICE!

- PowerBook 540c (33MHz 'LC040, 12MB RAM, 525MB Hard Drive, 640x480 Color Active Matrix Screen, Two Intelligent Batteries)
- *FAXModem*
- *Targus Deluxe Carrying Case*
- *HP DeskWriter 320 Port. B/W & Color Printer*
- *ABC DELUXE PowerBundle:* Symantec SmartWorks, Connectix CPU, Norton Utilities, Hard Drive Utility Software, and a Surge Suppressor.

PowerBook 520c Color Power Package (same as above, but with PowerBook 520c 8/160, one battery).....$2869/$79 p/m

PowerBook 150 8/120HD + FAXModem.....$ CALL FOR BEST PRICE!

CUTTING EDGE MAC CLONE AUTHORIZED DEALER

NEW! Quatro Mac Clone System $1820

- Quatro 850 8/500MB HD w/CD ROM Drive (Quatro is a 68040 25MHz Authorized Mac Clone with 5 Drive Bays, 3 Full Size NuBus Slots, and 1MB VRAM. Full Mac Compatible + PowerPC Upgradable!)
- 17" .28 dot pitch Color Monitor • Extended Keyboard and Mouse

*per month on ABC Lease or Finance Plan

Advance Business Center • 23510 Telo Avenue, Suite 5, Torrance, CA 90505

ADVANCE BUSINESS CENTER

July 1995

1 (800) 723-8262
(310) 325-1422 • International: (310) 325-2687

1 (800) 723-8262
fax: (310) 325-4073

Circle 225 on reader service card

DIGITAL AXIS INTERNATIONAL

$199
Photoshop 3.0.1
(Full Version) With Purchase of Scanner or Wacom Tablet

17" Trinitron PowerMac Compatible $669
with 24 bit Accelerated Card $919
Ikegami CF-17A 17" Multi-Sync $799
Ikegami CT-17 17" Trinitron Multi-Sync $1099
Ikegami CT-21B 21" Flat Multi-Sync $2199

UMAX SCANNERS

BizCard Reader Mac $239
NEW **Gemini** Dual Lens, One-Pass Scanner $1489
Vista T-630 600dpi Three-Pass Scanner with PhotoShop LE and Word Link OCR $499
Vista S6 600dpi One-Pass Scanner.....$589
Vista S8 800dpi One-Pass Scanner.....$729
UC 1260 1200dpi.....$789
UMAX Transparency Adapter.....$399
PowerLook 1200dpi One-Pass Scanner.....$2199
Transparency Adapter for PowerLook $449

EA Research 24 bit Accelerated, Lifetime Warranty
EAsycolor 24 1152 Graphics Card $1099
EAsycolor 24 1360 Graphics Card $1449
EAsycolor 24 1600 Graphics Card $1999

Kodak PCD 225 .....$CALL
Kodak XLS Ribbon / Paper .....$139 / $69
Other XLS / ColorEase Consumables .....$CALL
JVC Personal RomMaker.....$CALL
MacroMedia Director.....$789

DIGITAL AXIS INTERNATIONAL

Painter 3.0 ..... $269
With Purchase of Scanner or Wacom Tablet

WACOM Pressure-sensitive Graphics Tablets
12" x 18" Standard / Electrostatic.....$659 / $795
12" x 12" Standard.....$499
6" x 8" ArtZ.....$299
4" x 4" ArtPad.....$149

International Dealers Welcome

800-247-4678
512-329-7001
Fax 512-327-0921
5000 Plaza on the Lake, Ste. 250, Austin, TX, USA 78746
DIGIAXIS@ONR.COM

Wire transfer, COD accepted. Credit card fees may be assessed. Prices subject to change without notice. UPS, FedEx, DHL 2-day to Europe.

Circle 83 on reader service card

Your Single Direct Source for Macintosh® Peripherals & Software.

Authorized Reseller

DIRECTWARE™

HARDWARE & SOFTWARE SHIPPED ANYWHERE

Turn to the next two pages for more great Mac deals!

We are members of the DMA, the oldest and largest trade association in its field. Our membership signifies our commitment to the complete satisfaction of our customers.

Shown Above: our DirectWare Corporate Headquarters in Torrance, California.

Reliability & Trust

have been an important factor in our success as the number one computer reseller in Southern California. Since 1985, we have delivered what and when we promise to our Fortune 500 customers. Our goal is to provide you, the end-user, with this same high level of reliability & trust. We want to *earn* your business!

Your Satisfaction

is our number one priority with no hassles, great prices and honest people. Give us a call at 800•490•WARE and you will immediately see the difference in *service*!

Grand Opening Specials!

Prices valid through June 30, 1995.

Bonus FREE CD-ROM

Gift to first 100 customers from this ad! Our way of saying THANK YOU!

Title will be Nautilus CD or BMUG/AOL/Personal Training CD

Fast Delivery! FedEx as low as $5*

NEW! ADESSO **Tru-Form** *Ergonomic Keyboard*

105-key layout, split space bar, built-in contoured wrist support.

#144780 **$88.99**

Win a new Apple PowerMac! *See next page!*

MYST CD *with BONUS TIP-BOOKLET!*

$43.99 #110130 EXCLUSIVE!

Microsoft Free MS Word Training Software or Video worth up to $79.95

OFFICE 4.2.1 **$438.99** #101670 for Macintosh

NEW!

WORD 6.0 **$79.99**** UPGRADE with rebate #102788

When you purchase Office or Word for Mac, get by mail: MacAcademy Word 6.0 Video or Personal Training Systems module tape or CD. Coupon with purchase good through 8/31/95.

Soft Touch+ ADESSO *Mac Extended Keyboard*

TWO EXTRA ADB PORTS!

BEST BUY!

Reg. price $59

#144807 **$49**

FREE DELUXE WRIST PAD!

HEWLETT PACKARD *Authorized Dealer*

NEW!

600dpi, 3MB RAM PostScript Level-2

HP LaserJet 5MP *printer for Mac*

- 250-sheet paper tray
- IrDA-compliant infrared port
- 6 pages-per-minute engine
- 20-MHz processor, 2 SIMM slots
- Includes microfine toner cartridge

$949 #139902

GRAND OPENING SUPER SPECIALS!

HP ScanJet 3C *scanner for Macintosh*

NEW!

- 600dpi optical resolution, 2400dpi enhanced resolution
- Includes Caere WordScan OCR
- 24-bit color flatbed scanner
- One year HP Warranty

$899 #139882

HP DeskWriter 660C *inkjet printer for Mac*

- 600x300dpi color and 600x600 black printing
- Envelope feeder
- 27 built-in fonts

3-Year Warranty

NEW! **$449** #125374

See additional ordering terms on third page. Some items may have limited availability. Sales tax will be added to orders where applicable. Call customer service before returning any product. Refused shipments will be charged for shipping and handling. **MS Word price after $30 mail-in rebate thru 8/31.

VISA MasterCard American Express Discover

The DirectWare ADVANTAGE

- ✔ DirectWare is the mail order division of the #1 computer reseller in Southern California, in business since 1985 with over 65,000 satisfied business customers!
- ✔ Accurate, pay only for "what you order" shipping methods. We charge you actual shipping and don't mark up prices to cover costs of "free shipping".
- ✔ Highly trained telephone sales representatives, not "order takers". We listen to you and respond to *your* needs!
- ✔ Ethical staff. No deceptive business practices.
- ✔ Toll free technical support for our customers with certified personnel.
- ✔ No credit card surcharges, and we NEVER charge your card until the order is on its way to you!

CLARIS **Impact** *FREE on CD with purchase of* **ClarisDraw 1.0**

GET BOTH FOR ONLY **$179** #144503

EPSON **STYLUS COLOR** *720x720 dpi Inkjet Printer*

BEST BUY!

"At 720dpi it provides by far the best output of any printer in its class" says MacWeek. Provides brilliant photorealistic prints!

#125184 **$499**

UMAX *The Magic of Color*

BEST BUY!

Transparency Adapters *for Umax Color Scanners*

Add ability to scan 35mm slides, 4x5, 2x3 or larger transparencies at resolutions up to 6400dpi.

~~$489~~ **$339**

Model UTA-V for Vista-T630, S6 and Vista S-8 #144797

Model UTA-1E for 1260 #144795

Selection

is our hallmark. Our giant modern warehouse stocks all the best and hottest Mac and PC products for same/next day shipping!

Exclusive BONUS

Floppy of Plug-ins for Photoshop

Contains dozens of filters for any program that can use Photoshop plug-ins. FREE with purchase of any scanner or DTP software title (Claris Draw, Photoshop, Painter)

Newer TECHNOLOGY **Power Clip**

Accelerate Mac 6100 or 7100 up to 40% faster!

#144781 **$133**

24-Hr. Fax Order Line 310.793.7175

Fax-on-Request Service 310.793.8606

Customer Service 310.793.4580

Visit Our Booth at Macworld Boston!

For Great Service, Call Toll-Free Today

1•800•490•WARE (9273)

Please circle 88 on the Reader Response Card for a free DirectWare catalog!

Offer Code MWM9506

"Service is our specialty, always."

DIRECTWARE™

HARDWARE & SOFTWARE SHIPPED ANYWHERE

FedEx

For Great Service, Call Toll-Free Today

1•800•490•WARE (9273)

Extended Warranties

The ITT Advantage

Now you can extend any manufacturer warranty to four years (48 months) with complete in-home warranty service!

Guaranteed warranty extension covers parts and labor with replacement of unit if device cannot be repaired! Transferable with no deductible. Toll-free service. Repair service in all 50 states. Performance guarantee on repair work. Commercial warranties available. For products purchased from DirectWare.

$351-$700	$701-$1200	$1201-$2000
$59.99 #144810	$99.99 #144811	$144.99 #144812

On left is purchase price of hardware product, to right is warranty cost.

ADESSO ProPoint

with built-in 2 button, touch sensitive pointer

97-key layout featuring separate numeric keypad and 12 function keys. Fully ADB compatible. Built-in opto-mechanical, touch sensitive 2-button pointer (ThinkPad-style device) meets pointing device needs without sacrificing desk space. **FREE "Open Sesame" software!**

NEW!

#144808

$72.99*

*After $10 mail-in rebate. Our price is $62.99

Tru-Form *Ergonomic Keyboard*

NEW!

Finally a high quality ergonomic design for Mac which positions your hands naturally on the keyboard. Ergonomically countoured with a built-in wrist support. 105-key layout with separate numeric and cursor keypads, split spacebar.

$88.99 #144780

HP DeskWriter 320 *PRINTER*

offers highest quality mobile printing with crisp 600x300 dpi print. Three pages-per-minute for black text. Lightweight international power adapter. 35 scalable fonts. Handles cut sheets, transparencies and labels. #138809 **$279**

HP DeskWriter 540 *PRINTER*

Affordable 600x300 dpi printing on plain paper. Two pages per minute print speed. Handles envelopes, paper to 8.5x14", 35 scalable fonts. Three year warranty. #139892 **$269**

HP Scanjet 3P *scanner*

300dpi grayscale flatbed scanner features 256 levels of gray. Includes OCR and image scanning software. Up to 1200dpi. Copier software included. #125471 **$459**

HEWLETT PACKARD *Authorized Dealer*

Micronet Master CD

NEW!

Professional quality CD-ROM recorder, great for back-up, archiving, multimedia, one-off music CD masters and much more! 2x speed, records 650MB in about 30 minutes. Includes critically acclaimed software worth $1999 and superior Micronet quality! #115591 **$1889**

SupraExpress™ 144 Plus

14.4 FaxModem for Macintosh

Includes FAXcilitate fax software, MicroPhone LT and CompuServe Information Mgr. #109107 **$97**

Send for our free catalog!

Available the end of July, 1995. Our complete catalog features only the BEST Mac peripherals, hardware and software at great prices. Simply mail the postage-paid postcard bound into the magazine, or use the magazine reader response card and we'll send you one when available.

Or call us for a catalog at

800-490-WARE

Authorized Reseller

SOFTWARE DIRECT

ADOBE (and previously Aldus)		
Acrobat 2.0	#116084	$121.99
Datebook Pro 2.0	#117988	$42.99
Dimensions 2.0	#117078	$123.99
Fetch 1.2 Single User	#109890	$92.99
Illustrator 5.5 with CD	#116080	$369.99
Pagemaker 5.0a	#144805	$572.99
Pagemaker PowerMac	#144806	$572.99
Persuasian 3.0	#108134	$299.99
Photoshop 3.0.1	#116124	$566.99
Premiere 4.0	#116150	$503.99
Streamline 3.1	#117083	$124.99
Type Manager 3.8 PPC	#117074	$38.99
BERKELEY		
After Dark 3.0	#112829	$28.99
Simpsons Screen Saver	#112840	$26.99
Star Trek Screen Saver	#105867	$27.99
CLARIS		
Claris Works 3.0	#116457	$116.99
Claris Impact 1.0	#112026	$129.99
Filemaker Pro 2.1	#112017	$86.99
Filemaker Comp. Upgd	#112025	$110.99
MacProject Pro 1.5	#112013	$362.99
MacWrite Pro 1.5	#116414	$87.99
CONNECTIX		
RAM DOUBLER 1.5	#106280	$53.99
ENTERTAINMENT SOFTWARE		
Maxis SimCity 2000	#112192	$38.99
Velocity Spectre VR CD	#144800	$38.99
Star Trek 25th Ann. CD	#144801	$41.99
FRACTAL DESIGN		
Painter 3.0	#107919	$299.99
Sketcher 1.0	#107911	$49.99
Dabbler 1.0	#107916	$58.99
HSC SOFTWARE		
Kai's Power Tools 2.1	#123456	$110.99
KPT Bryce 1.0	#110860	$111.99
INSIGNIA SOLUTIONS		
Access PC 3.0	#110256	$78.99
MACROMEDIA		
Director 4.0 Bundle	#111980	$749.99
Freehand 5.0 NEW	#117296	$349.99
Freehand comp. upgrd	#117301	$138.99
Action Bundle	#135071	$202.99
Fontographer 3.5	#105233	$245.99
QUARK		
XPress PMac 3.3.1 CD	#106571	$659.99
QuarkXPress 3.3.1 Mac	#106568	$569.99
SPECULAR		
Infini-D 2.6	#144802	$399.99
SYMANTEC		
ACTI 2.0	#106856	$154.99
Norton Utilities 3.1	#106862	$95.99
SAM AntiVirus 4.0	#106860	$64.99
Suitcase 2.1	#108236	$64.99
WORD PERFECT		
Word Perfect 3.1	#137546	$86.99
UTILITY SOFTWARE		
Caere Omnipage Pro 5	#114551	$309.99
C&G Conflict Catcher II	#107949	$49.99
FWB CD-ROM Toolkit	#111157	$49.99
FWB HD Toolkit Persnal	#144803	$49.99
Lightsource OFOTO	#107922	$187.99

EXCLUSIVE! FREE "Floppy of Plug-Ins" for Photoshop, etc. with any DTP/Multimedia product purchase! For a limited time only!

Vendors: for information on participating in our DirectWare marketing program call Christopher Simmons at 310.793.4500

HARDWARE DIRECT

DAYSTAR Accelerators		
100MHz PowerPro601	#109600	$1669.99
66MHz PowerCard 601	#109596	$619.99
PowerPro 601 66	#109601	$1669.99
PowerPro 601 80	#109603	$1799.99
Turbo 601 66MHz	#109595	$979.99
HEWLETT PACKARD		
LaserJet 4ML	#139907	$1019.99
LaserJet 4M Plus	#139888	$1899.99
LaserJet 4MV	#139900	$2799.99
DeskJet 1200C	#138408	$999.99
Color Kit 540/320 inkjet	#125619	$32.99
MICRONET		
MasterCD Pro 4x Rcrdr	#115597	$4699.99
MICROTEK		
35T Slide/Film Scanner	#112372	$967.99
NEC		
XV17 Monitor NEW	#128829	$799.99
NEC 2V CD-ROM	#125947	$248.99
NEX 3XP plus CD-ROM	#125950	$479.99
NEX 4XE CD-ROM	#123953	$503.99
SilentWriter640 printer	#121226	$699.99
PINNACLE MICRO		
RCD1000 CD Recorder	#131849	$1749.99
Sierra 1.3GB Optical	#136259	$2399.99
QUANTUM Internal SCSI Drives (Raw)		
Empire 1080MB (1GB)	#110844	$599.99
Lightning 540MB	#117911	$236.99
Lightning 730	#117903	$293.99
Atlas 2100MB (2.1GB)	#110850	$1169.99
RADIUS		
VideoVision Studio 2.0	#103156	$3779.99
Precision Color 24XP	#141235	$271.99
Spigot Power AV	#118087	$799.99
SONY		
SRS-PC50 Speakers	#111810	$89.99
Blank CDR 63min 553mb	#125943	$10.99
SUPRA Modems		
FAXmodem 28.8PB	#109104	$299.99
FAXmodem 14.4+ Ext.	#109094	$179.99
U.S. ROBOTICS		
Mac&Fax Sportster14.4	#118979	$119.99
VIKING MEMORY		

Please call to verify current memory prices. We do carry PowerBook memory, too!

8MB 32-bit Simm 70ns	#144817	$CALL
16MB 32-bit 70ns	#144818	$CALL
32MB 32-bit 70ns	#144816	$CALL
8MB 32-bit Simm 60ns	#144819	$CALL
16MB 32-bit 60ns	#144820	$CALL
32MB 32-bit 60ns	#144821	$CALL
Genuine SYQUEST® CARTRIDGES		
88MB Cartridge	#106690	$47.99
200MB Cartridge	#143399	$77.99
105MB Cartridge	#143395	$53.99
270MB Cartridge	#107795	$63.99

SONY

MultiScan17sf Trinitron Display

#115224 **$894**

ENTER TO WIN A FREE APPLE® POWER MAC™!

Your choice of either a Power Mac or IBM Pentium starter system (IBM subject to availability).

As part of our Grand Opening Celebration, we're giving away a computer! Simply fill out the postage paid postcard bound into the center of this ad. Drawing will be held August 31, 1995 from all postcards received. Limit one entry per person, group, address or family. Excessive entries will be disqualified. Employees or business partners of DirectWare and NovaQuest InfoSystems are not eligible. Pentium system will be basic starter package without monitor. PowerMac is a 6100, without monitor. Either system will include an Adesso ergonomic keyboard. Winner is responsible for any taxes. Mail postcard entries to: DirectWare, Box 11191, Torrance, CA 90510.

DIRECTWARE™

HARDWARE & SOFTWARE SHIPPED ANYWHERE

UMAX®

The Magic of Color™

Vista-T630 Pro

600x300 color scanner

Great 24-bit scanner for video and multimedia, web pages or presentations, or OCR scans.

- Scan up to 8.5 x 14" art
- Includes Photoshop LE
- Includes WordLink OCR
- Up to 4800dpi resolution, 600x300 optical resolution
- Toll-free technical support•

Transparency Adapter option only $339!

#144798 **$479**

UC1260 *600x1200 color scanner*

Great 24-bit scanner for graphic professionals who need to prepare artwork for printing.

- Scan up to 8.5 x 14" artwork
- Includes full Photoshop 3.0.1
- Includes Kai's Power Tools SE and Kai's Power Photos CD
- Bonus Pixar Typestry & 128CD
- 3-pass, up to 9600dpi resoltn.

Transparency Adapter option only $339!

#144797 **$899**

Vista-S8 Pro

One-pass 800x400 Color Scanner

High quality 24-bit color scanner, with enhanced resolution to 6400dpi. Maximum image 8.5x11.7"

- Includes Adobe Photoshop 3.0.1 (full version)
- Pixar Typestry and Pixar 128 CD-ROM
- Kai's Power Tools SE & Power Photos CD-ROM

Transparency Adapter option only $339!

#144796 **$839**

Microsoft®

BEST SELLING MACINTOSH SOFTWARE

EXCEL 5.0	#103321	$279.99
EXCEL Version Upgrade	#103323	$113.99
FoxPro 2.6	#109961	$88.99
Office 4.2.1 Upgrade	#101671	$229.99*
PowerPoint 4.0	#103614	$298.99
PowerPoint 4 Upgrade	#103615	$118.99
Project 4.0	#103538	$418.99
Word 6.0.1 *Improved!*	#102784	$289.99**
Works 4.0	#103460	$78.99
Cinemania CD 1995	#107342	$47.99
Encarta CD 1995	#107534	$84.99

*After $40 mail-in rebate thru 8/31/95

**INCLUDES $79 in FREE Tutorial Products!

"The World's Best Value in Power Protection."

Back-UPS®

The award winning **Back-UPS** line gives you 100% power protection for your Mac or workstation. Protect yourself from hardware damage and data loss with the legendary reliability of the **Back-UPS**! The **Back-UPS** line features unmatched surge and lightning protection with battery back-up, hot-swappable user replaceable batteries, communications interface port (400), test switch (400), site diagnostics, user adjustable option switches, full UL and CSA approvals!

$25,000 LIFETIME EQUIPMENT PROTECTION POLICY

2 YEAR WARRANTY

Back-UPS 200 • 200VA UPS
2 outlets; for energy efficient Macintosh models #136391 **$94**

Back-UPS 280 • 280VA UPS
2 outlets; for network stations, standalone systems #136394 **$104**

Back-UPS 400 • 400VA UPS
2 outlets; for desktop Power Mac models #131300 **$144**

APC™ AMERICAN POWER CONVERSION

Why settle for a no-name in storage? Choose CMS instead!

Since 1983 CMS has delivered over 3 million quality drives!

MightyLite™

Portable external drives for PowerBook and Duo. Fits in your hand. Automatically terminates SCSI bus.

340MB #139542 **$549**

520MB #144824 **$679**

Platinum Lite

Low Profile External Drives

340MB 12ms SCSI-2	#139535	$344
540MB 10ms SCSI-2	#139537	$389
730MB 11ms SCSI-2	#144823	$469
1.0GB 10ms SCSI-2	#141993	$739

Platinum II External Drives

2.15GB 8ms SCSI-2	#141724	$1329
4GB 9ms SCSI-2 #139543		$2499
9GB 9ms SCSI-2 #144822		$4069

SyQuest®

High quality external systems include cable, one cartridge and utility software.

200MB #144825 **$499**

270MB #144827 **$539**

MICROTEK

Better Images Through Innovation.

ScanMaker® III

Award winning, 36-bit 1200dpi scanner

Capable of scanning 12 bits per RGB color channel with an increased color range. Gradations look better, color is richer. Ideal for all professional scanning applications. One-pass scanning up to 8.5x14". 1200x600dpi optical resolution (up to 2400dpi through software). 68.7 billion colors! Includes Microtek's scan software, DCR™ color calibration, **full version of Adobe Photoshop!**

#112371 **$2365**

ScanMaker® IISP

One-pass, high quality 600dpi scanner

Fast single-pass 24-bit color scanner captures up to 16.8 million colors at 600x300dpi (1200dpi through software). Perfect for artists and publishers, multimedia and OCR. INCLUDES **Color It!** image editing software from MicroFrontier and **OmniPage Direct** OCR software from Caere. Award-winning quality!

$535 #112393

ScanMaker® II

Affordable high quality 600dpi scanner

Three pass color scanner, scans up to 8.5x14" images in vivid 24-bit color. 600x300dpi resolution (1200dpi through software). Ideal entry level color scanner for home office use, OCR and classroom. INCLUDES **Color It!** image editing software from MicroFrontier and **OmniPage Direct** OCR software from Caere.

$455 #112394

Newer TECHNOLOGY

Mac Clip & Power Clip

Remarkable accelerator gives up to 40% increase in chip performance, especially on the Centris 610 and Power Mac 6100. Average performance increase of 20%. Guaranteed compatible!

for 6100 or 7100 #144781 **$133**

for 800 or 840a #144783 **$133**

for 610, 650, 660 #144782 **$133**

Newer Technology Mac Memory

Please call to verify current memory prices due to fluctuating costs.

16MB 70ns #144787 **$509**

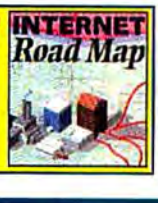
32MB 70ns #144788 **$1029**

16MB 60ns #144789 **$519**

FREE Grand Opening BONUS "INTERNET ROAD MAP"

with purchase of any modem from DirectWare!

Helps you find all the "cool" Macintosh spots on the WEB and the best UseNet Groups! Unfolds to GIANT poster! VERY USEFUL! *Limited Supply, so please hurry.*



ERMS: FedEx second day shipping is approximately $5.00 for 5 lbs. or less, $1.00 per lb. after 5 lbs. plus insurance and packaging material. A charge of freight insurance is .005% of order total. Packing material and handling charge of $3.00 per order. For your protection we ship only to your verified billing address. Non-defective returns subject to a restocking fee. No returns accepted without an RMA# (call customer service). Most software and memory chips are not returnable, unless covered by a manufacturer's return policy. Next day service available most areas. Certain product cannot be shipped outside of U.S. While we do our best to check for errors, occasionally mistakes can occur. Prices and availability are subject to change. Call for current pricing. For faster service, our system recognizes existing customers by phone number and instantly locate prior order records and information. All trademarks used to benefit and without intent to infringe on trade holders. Copyright © 1995 DirectWare.

Fax-on-Request Service

Get detailed information on products from APC, Adesso, UMAX, Microtek, Newer, CMS and more! Simply follow directions, and get the facts by fax!

24-Hr. Fax-on-Request Service 310.793.8606

VISA MasterCard American Express Discover **FedEx**

DirectWare is open to serve your needs from 5:00am to 10pm (PST), 8am to 1am (EST). Customer Service hours 8am to 7pm (PST).

24-Hr. Fax Order Line
310.793.7175
Customer Service
310.793.4580
Tech Support for Customers
800.610.9273

For Great Service, Call Toll-Free Today

1•800•490•WARE (9273)

Please circle 88 on the Reader Response Card for a free DirectWare catalog!

Offer Code MWM9506

MAC BARGAIN$

DI$COUNT PRICE$ ON QUALITY HARDWARE, $OFTWARE & ACCE$$ORIE$

Buy with Confidence from MAC BARGAIN$.

- A leading direct marketer of Mac products
- Over 2500 products in stock
- Most orders ship the next day
- Our goal is 100% customer satisfaction

Great Deals!

Only $139

PCTalk Adapter Kit

- The easiest way to connect PCs to Macs
- Snaps onto the parallel port of any PC or PS/2 for instant connection
- Lets you share LocalTalk network resources, including laser printers, AppleShare servers, scanners and applications
- The only external LocalTalk adapter available today!

Apexx Technology #95356

Only $227

Teleport Platinum for Desktop Macs

- True V.34 modem communications
- Super-fast 28.8Kbps data transmission speed significantly reduces expensive on-line charges
- V.42bis data compression for even faster transmission speeds
- Includes award-winning GlobalFax OCR software for converting your faxes into editable text

Global Village #01155

Only $649

Genova 17" Color Monitor

- Glare-free screen for long viewing without eye strain
- Spacious 17" screen (15" diagonal viewable area)
- Displays any image up to 11.8x8.8" without reducing or scrolling
- Ultra-high 832x624 resolution with .28mm dot pitch
- Vertical refresh rate of 75Hz for flicker-free images

Genova #91550

Illustrator 5.5 Cross Grade *#92200*

Only $134

Abacus Concepts

00032	Sidview 4.0	$446.98

ACI US

94322	4D Chart 1.0	$214.98
96355	4D First 1.2	$94.98
99044	4D Server 1.2 Version Upgrade	$148.98
02648	4th Dimension 3.2	$398.98
99043	4th Dimension 3.2 Version Upgrade	$58.98

Adobe Systems

18694	Acrobat 2.0 for WorkGroups	$999.98
93952	Acrobat 2.0	$122.98
95323	Acrobat Pro 2.0	$376.98
92217	HomePublisher V2.0 Deluxe CD	$64.98
92218	SuperPaint V3.5 Deluxe CD	$64.98
91229	DateBook Pro V4.0 Deluxe CD	$43.98
94159	Design Kit for PageMaker 4.0 to 5.0	$44.98
06263	Dimensions V2.0	$121.98
95314	Fetch V1.2 Single-User	$93.98
05806	Illustrator V5.0-5.5 Upgrade	$90.98
92200	Illustrator 5.5 Cross Grade	$134.98
99431	Illustrator V5.5	$361.00
91608	PageMaker V5.0 Mac/PowerMac	$539.98
91618	Persuasion V3.0 Mac/PowerMac	$249.98
04342	Photoshop 3.0	$558.98
95341	Photoshop 3.0 Upgrade	$136.98
05702	Premiere V3.0-4.0 Upgrade	$71.98
04670	Premiere V4.0	$501.98
91600	Print Central 4.0	$438.98
03971	Streamline V3.1	$121.98
06712	TouchBase Pro V4.0	$43.98
03950	Type On Call 4.0	$42.98

Aladdin

98501	StiCom	$61.98
05827	StuffIt Deluxe 3.5	$69.98

Alias Research

98301	Sketch!	$519.98

Alsoft

00618	DiskExpress II 2.2	$42.98
04543	Master Juggler 1.9	$31.98
03552	Avery MacLabel Pro	$49.98

Artifiko

92261	DesignWorkshop	$399.98

ASD

03286	FileGuard	$136.98
03323	FileGuard Office Pack 10-User	$784.98

Caere

05161	OmniPage Direct V2.0	$59.98
01005	OmniPage Pro V5.0	$449.98

Casady & Greene

91300	Conflict Catcher 3	$64.98

Claris

18052	ClarisDraw	$246.98
93424	ClarisWorks V3.0	$117.98
03478	FileMaker Pro V2.1	$88.98
99734	Impact V1.0	$129.98
04140	MacProject Pro V1.5	$359.98
06525	MacWrite Pro V1.5	$88.98

Connectix

05646	PowerBook Utilities	$53.98
96785	RAM Doubler	$53.98

Corel

96331	Corel GALLERY	$31.98
Call	Corel Professional Photo CD's - Call	$18.98
00203	Cricket Graph III	$84.98

Dantz

04722	DiskFit Pro V1.1	$68.98
02586	Retrospect V2.1	$134.98
04194	Retrospect w/ Remote 10-Pack	$244.98

Datawatch

02077	Vrex V5.5	$59.98

Dataviz

96907	MacLink Plus/PC Connect 8.0	$113.98
96908	MacLink Plus/Translators Pro 8.0	$93.98

Delrina

97921	FaxPro for Mac V1.5	$53.98
17271	Intermission Screen Saver	$27.98
97938	Opus & Bill Screen Saver	$27.98

DeltaPoint

04805	DeltaGraph Pro 3.5	$124.98
97780	DeltaGraph Pro 3.5 Comp. Upgr.	$74.98

Deneba

00803	Canvas V3.5	$252.98

Elastic Reality

98489	Elastic Reality for Power Mac	$209.98

Entertainment

94569	11th Hour: Sequel to 7th Guest-Virgin	$54.98
99236	7th Guest-Virgin	$41.98
02785	After Dark v3.0-Berkeley Systems	$25.98
92863	Arc of Doom-SunStar Publishing	$38.98
06108	Arthur's Teacher Trouble CD-Broderbund	$34.98
97125	AstroChase-MacPlay	$34.98
99575	BattleChess Enhanced-MacPlay	$44.98
99564	Carmen Sandiego/USA Dlx CD-Broderbund	$39.98
97732	Carmen Sandiego/World Dlx CD-Broderbund	$41.98
97122	Castles II: Siege & Conquest-MacPlay	$35.98
05848	Civilization-Microprose	$42.98
93544	Corpse Killer-Acclaim	$47.98
06394	Falcon MC-Spectrum Holobyte	$40.98
06852	Iron Helix CD-Spectrum Holobyte	$54.98
97127	Jump Raven-Paramount	$37.98
05991	KidDesk-Edmark	$28.98
04581	Leisure Suit Larry 6-Sierra On-Line	$46.98
05486	Lemmings-Psygnosis	$32.98
97146	Lunicus CD-Paramount	$37.98
96284	Marathon-Bungie Software	$37.98
05992	Miller's Math House-Edmark	$32.98
04053	More After Dark v1.0-Berkeley Systems	$22.98
99237	More Lemmings-Psygnosis	$32.98
05518	Music Time v2.0-Passport Designs	$84.98
97733	MYST-Broderbund	$46.98
93543	Night Trap-Acclaim	$47.98
97149	Peter Gabriel XPLORA 1-MacPlay	$44.98
00473	PGA Tour Golf II-Electronic Arts	$37.98
95423	Prince of Persia II-Broderbund	$34.98
97145	Rock, Rap, and Roll CD-Paramount	$39.98
94441	Sammy's Science House-Edmark	$32.98
04721	SimAnt-Maxis	$17.98
98222	SimCity 2000-Maxis	$37.98
93216	SimCity Classic-Maxis	$22.98
03300	SimEarth-Maxis	$19.98
94267	Simpson's Screen Saver-Berkeley Systems	$27.98
94569	Spectre VR CD-Velocity Development	$37.98
97197	Spectre VR-Velocity Development	$33.98
95426	Star Trek 25th Anniversary CD-MacPlay	$41.98
05934	Star Trek Screen Saver-Berkeley Systems	$26.98
05519	The Disney Screen Saver Collection-Berkeley	$25.98
04197	The Playroom 2.0-Broderbund	$29.98
97731	The Tortoise and the Hare-Broderbund	$34.98
93785	Thinkin Things II-Edmark	$39.98

Equilibrium

96901	DeBabelizer Lite	$82.98
96360	DeBabelizer Toolbox 1.6	$249.98

Fractal Design

00665	Fractal Design Painter 3	$301.98
93957	Fractal Design Painter 3 Upgrade	$144.98
93994	Fractal Design Painter 3 Upgr from Painter X2	$89.98

Frame Technology

03582	FrameMaker V5.0	$552.98

Farallon

96800	Timbuktu Pro	$125.98
96801	Timbuktu Pro Twin-Pack	$199.98
96802	Timbuktu Pro 10-Pack	$859.98

GDT Software

00542	PowerPrint 2.5	$93.98
94262	StyleScript	$94.98

99506	Gryphon Morph V2.5	$97.98

HSC Software

06668	HSC Kai's Power Tools V2.1	$113.98
96335	KPT Bryce 1.0	$117.98
96336	KPT Suite Imaging (Bryce & KPT)	$229.98
92243	KPT Convolver 1.0	$119.98
91629	Live Picture	$625.00

00897	MetaFisher V2.0	$93.95

Insignia

03664	Access PC V3.0	$74.98
06786	RapidCD	$42.98
98471	SoftWindows for Power Mac	$287.98
98475	SoftWindows for Power Mac CD-ROM	$287.98
94287	SoftWindows for Mac	$287.98

Intuit

90222	QuickBooks 3	$119.98
04230	Quicken 5	$39.98

HSC Live Picture *#91629*

Only $625

JIAN

04257	BizPlanBuilder 5.0	$78.98
01045	EmployeeManualMaker 3.0	$91.98
04996	LivingTrustBuilder 3.2	$51.98
06827	Publicity Builder 2.0	$84.98

Kent Marsh

04961	NightWatch II	$88.98
00258	Folderbolt V1.02	$68.98

Kodak

94926	Photo CD Access Plus	$35.98

Leader Technologies

05690	PowerMerge 2.0	$78.98

Light Source

99489	Otto 1.1.1 (Gray Scale)	$132.98
00657	Otto 2.0	$167.98

Lotus

00507	1-2-3 V1.1	$274.98

Macromedia

04537	Fontographer V4.1	$328.98
94180	FreeHand 5.0	$385.98
92257	FreeHand 5.0 Competitive Upgrade	$148.98
94182	FreeHand 5.0 Upgrade	$148.98
00839	Macromedia Director V4.0	$788.98
06310	MacroModel V1.5.3	$644.98
97770	SoundEdit 16 CD	$278.98
92290	Graphic Design Studio	$698.98

Mainstay

01159	MacFlow 4.0	$221.98
93218	Plan and Track	$191.98
99023	ManagePro V2.0	$99.98

Metrowerks

94281	CodeWarrior Gold	$359
92853	CodeWarrior Bronze	$89

Microsoft

99702	Cinemania 1995	$47
95750	Encarta '95	$83
00227	Excel V5.0	$288
04545	Excel V5.0 Ver Upg	$198
04293	Flight Simulator V4.0	$38
99696	FoxPro V2.6	$87
00427	Office V4.2	$428
01220	PowerPoint V4.0	$287
04161	Project V3.0	$410
06184	Project V3.0 Upg	$129
04898	Word V6.0	$283
00596	Word V6.0 Upg	$168
05750	Works 4.0	$83

Microspot

05641	MacPlot Pen Plotter Professional 4.0	$259

Microtac Software

95417	French Assistant	$46
95416	German Assistant	$46
95415	Italian Assistant	$46
95418	Spanish Assistant	$46

Only $139

RunShare LocalTalk 6 User *#92179*

MYOB

04712	MYOB Accounting V5.0	$78
99042	MYOB Accounting V5.0 w/Payroll	$132
	Nisus Software	
93236	Nisus Writer 4.0 Comp Upgrade	$114
03479	Nisus Writer 4.0 for Mac	$269
93238	Nisus Writer w/Language Key 4.0	$328

Now Software

00580	Now Up-to-Date V3.0	$58
04191	Now Utilities V5.0	$76
04906	Org Plus 1.0	$121
02594	Peachtree Accounting	$113
05745	Peachtree Insight Accounting	$294

OSC

96277	Deck II v2.2	$328
96278	Metro 3.0	$172

Pixar

05668	Pixar Typestry V2.1	$185

Quark

04736	QuarkXPress V3.31	$568
95320	QuarkXPress for Power Mac	$638

Photodex

96508	The Picture Factory Set 1	$38

PhotoDisc

97349	PhotoDisc Starter Kit	$38

Ray Dream

05965	addDepth	$98
00441	Designer V3.0	$221
04150	JAG II	$83

Shana Corp.

94313	Informed Database Extensions 1.0	$78
05830	Informed Foundation 1.4	$248
04547	Informed Manager 1.4	$98

Sketch Tech

96356	upFRONT	$218

SoftKey

95594	American Heritage Talking Dictionary CD	$39
03631	Calendar Creator	$42
99029	KeyCad Complete	$25
00641	WriteNow V4.0	$43

Specular International

99535	Collage	$269
00815	Infini-D 2.6	$498
96285	Logomotion	$196

Stalker Software

92868	Portshare Pro	$86
92867	LineShare	$49

Symantec

06231	ACT! V2.0	$154
06997	Disk Doubler Pro V1.1	$74
04413	DiskLock V3.0	$89
03481	MacTools 4.0 Pro	$93
04890	Norton Utilities V3.1	$89
00116	SAM 4.0	$82
04776	Solitaire V2.1	$4

06243	Software Ventures MicroPhone Pro	$139

T/Maker

92282	ClickArt Creative Fuel CD	$69
99555	ClickArt Incredible Image Pak CD	$47

93876	the TypeBook	$31

94986	Video Director 1.5	$129

00481	WillMaker 5	$37

WordPerfect

03972	WordPerfect 3.1	$6
05013	WordPerfect V3.1 Ver Upg	$5
96375	Grammatik V6.0	$3

Call MAC BARGAIN$ *before you buy!*

1-800-619-9091

Why get slower ground shipping

Overnight Delivery Only $6.00 and up

Add applicable sales tax (only in WA, OH). All shipments refer to "in stock" items, barring system failure, etc. Not responsible for typographical errors. Credit cards are not charged until the order is shipped. Most products ship the same day for overnight delivery. Orders over 10lbs charged actual freight. Call for international shipping rates. Packaging and handling up to $6 per order. Returns subject to a restocking fee. Prices and product availability subject to change without notice. Specials and promotions may be limited to stock on hand.

For the Best Deals Around!
1-800-619-9091

MONITORS

Sony

Multiscan 15sf	$444.99
Multiscan 17sf	$878.99
Multiscan 20se	$1,863.00
Multiscan CPD-1425	$329.98

Radius

20GS 20" Monochrome	$784.98
Full Page Display - Grayscale	$489.98
Intellicolor 20e D spiay	$1,699.00
PrecisionColor 17" Color	$998.98
SuperMatch 17T	$915.98
SuperMatch 21TXL	$2,033.00

NEC

NEC MultiSync 2V 14"	$327.98
NEC MultiSync 3V 15"	$466.98
NEC XE15 15" Color Mtr	$537.98
NEC XE17 17" Color Mtr	$996.98
NEC XE 21 21" Color Mtr	$1,978.98
NEC XP 15 15" Color Mtr	$659.98
NEC XP 17 17" Color Mtr	$1,235.00
NEC XP 21 21" Color Mtr	$2,446.00

VIDEO/GRAPHICS BOARDS

Connectix

QuickCam	$97.98

EA Research

EAsyColor 24/1600 Accelerated Graphics	$1,898.00
EAsyColor 24/1360 Accelerated Graphics	$1,498.00
EAsyColor 24/1152 Accelerated Graphics	$998.00

Light Source

ColorTron	$1,149.98

Radius

Photo Engine	$639.98
Precision Color 8XL 8-bit	$455.98
PrecisionColor Pro 24X	$1,057.00
PrecisionColor Pro 24XK	$749.98
PrecisionColor Pro 24XP	$3,598.00
VideoVision Studio 2.0	$3,598.00
VideoVision Studio 2.0 Pro Pak w/RAID HD	$8,998.00
Spectrum Power 1152	$686.98
Spigot Power AV	$799.98
Thunder 24 VZ 0	$863.98
Thunder IV GT	$1,379.98
Thunder IV GX 1600	$2,858.00
Thunder IV GX 1360	$2,399.00
Thunder IV GX 1152	$1,999.00
Video Spigot II Tape	$699.98

Raster Ops

PaintBoard Prism GT	$879.98
PaintBoard Prism	$659.98
ClearViaColor 20T Monitor	$1,599.00

XCEED Technology

Color Fusion 24-bit LCs	$489.98

ACCELERATORS

DayStar

PowerPro 601 66MHz Xel	$1,349.98
PowerCard 66MHz	$599.98
PowerPro 100MHz	$1,739.00
PowerPro 601 80MHz Xel w/1MB Cache	$1,899.00
Turbo 601 166MHz for Ilci	$1,739.00
Turbo 601 100MHz for IIsi	$1,739.00
Turbo 601 100MHz for IIsi, vx P600	$1,739.00
Turbo 601/66MHz	$1,191.54

K S Labs

PowerMac 8100/7100 Booster	$69.00
PowerMac 256k Cache Card	$139.00
PowerMac Booster/Cache Bndl	$189.00
Quadra and Centris Boosters	$69.00

Newer Technology

Power Clip for 610/7100	$139.98
MaxClip for Centris/Quadra 610	$139.98
MaxClip for Quadra 800/840AV	$139.98

NETWORKING

Asanté

10T FriendlyNet Adapter	$52.98
10T HUB/8 w/ 10T/TN Ports	$223.98
MacCon+LC 10T	$84.98
MacCon+LC 10T/TN	$159.98
MacCon+LC TN	$104.98
MacCon+ NuBus 10T/TK	$109.00
MacCon+ NuBus TN/TK	$117.98
MC+200E764 ISI & SE/30 (TK+10T)	$145.99
MC+IIE64 Mac II & Performa 600 (TK/TN)	$153.98
MC+IIX8 Mac II & Performa 600 (TN/TK+10T)	$198.98
MC+LC10T/II LC, LCII, LCIII (10T)	$129.98
Micro EN/SC for PowerBooks 10T	$218.98
Micro EN/SC for PowerBooks 10T/TN	$277.98
Mini EN/SC for PowerBooks (10T)	$235.98
Mini EN/SC for PowerBooks (10T/TN)	$228.98
NetExtender Hub (AUI/10T)	$119.98
NetExtender Hub FN (AAUI/10T)	$129.98
Trick FriendlyNet Media Adapter	$65.98
Trio FriendlyNet Media Adapter	$54.98

Dayna

Dayna Pocket SCSI Link M (10T/TN)	$287.98
Dayna Pocket SCSI Link T (10T)	$235.98
DaynaLINK Mobile Access Server PARA	$1,999.00
DaynaPORT E/I (TN/TK) DP0230	$114.98
DaynaPORT E/I-3 (10T/TN) DP0232	$159.98
DaynaPORT E/I-T (10T/TK) DP0201	$107.98
DaynaPORT E/I-TN (TN) DP0400	$98.98
DaynaPORT E/I-M (10T/TN) DP0405	$157.98
DaynaPORT SCSI Link-3 (10T/TK/TN) P PB	$299.98
DaynaPORT SCSI Link-3 DP0282	$297.98
DaynaPORT SCSI (10T/TK) DP0511	$145.98
DaynaSTAR MiniHub-5	$147.98
EasyNet Transceiver 10T/AAUI	$55.98
EasyNet Transceiver TN/AAUI	$55.98
EtherPrint 3 (10T/TK/TN)	$353.98
Mini EtherPrint Plus 10T/TN	$429.98
Mini EtherPrint-T 10T	$349.98
Mini EtherPrint-T 10T/TN	$359.98

Farallon

Ether 10T Starlet/16	$568.98
Ether 10T Starlet/4	$168.98
Ether 10T Starlet/8	$238.98
Ether10-T Transceiver (AUI/10T)	$84.98
EtherTran Transceiver (AAUI/TN)	$61.98
EtherWave AAUI Transceiver	$94.98
EtherWave AUI Transceiver	$96.98
EtherWave LC Card	$168.98
EtherWave NuBus Card	$169.98
EtherWave PB or Slotless Mac Adapter	$252.98
Etherwave Multi Printer Adapter	$335.98
PhoneNET DIN-8 10-Pk PN310	$184.98
PhoneNET DIN-8 PN308	$26.98
PhoneNET Star Connector PN301	$14.98

Ren

RenShare	$274.98
RenShare LocalTalk	$139.00

COMMUNICATIONS/MODEMS

Global Village

OneWorld Combo - 2 Line (no modems)	$1,274.98
OneWorld Combo - 2 Line (w/modems)	$1,774.98
PowerPort Bronze	$89.98
PowerPort Gold	$232.98
PowerPort/Mercury for PowerBook 100	$309.98
PowerPort/Mercury for PowerBook Duo	$309.98
PowerPort/Mercury for PowerBook 500	$338.98
TelePort Gold II	$125.98
TelePort/Mercury for Desktop Macs	$278.98
Teleport Platinum for Desktop Macs	$227.00

Practical Peripherals

MacClass MC2288I2-EZ PCMCIA	$359.98
MacClass MC14412-EZ PCMCIA	$169.00

ORA

Cellular Data Link	$198.98

Supra

Supra Express 144 Plus	$95.98
Supra FaxModem 144LC Ext - Mac	$128.98
Supra FaxModem 144PB Int - PowerBook	$157.98
Supra FaxModem 288 Ext - Mac	$283.98
Supra FaxModem 288 Int - Mac PB	$265.98
Supra FaxModem V32BIS (MC) w/Str Cable	$173.98

TT Systems

DLE-400 4-Device Auto Fax/Modem Switch	$94.98

TDK

TDK 28.8 PCMCIA Fax/Modem for Apple Sec	$339.00

US Robotics

Mac & Fax Sportster 14.4	$112.98
Mac & Fax Sportster 28.8 V34	$247.98

Apple Hard Drives

340MB Ext HD	$373.98
540MB Ext HD	$432.98
1080MB Ext HD	$839.98

FWB

CD-ROM Toolkit	$47.98
Hard Disk Toolkit - Personal Ed	$46.98
Hard Disk Toolkit	$122.98
SCSI JackHammer	$598.98

Iomega

Iomega MacTransportable 230	$452.98
Iomega MacTransportable 90 Pro	$280.98
Iomega MacTransportable Multidisk 150	$421.98
Zip Drive	$168.98

LaCie

Q Drive External 270MB	$299.00
Q Drive External 340MB	$329.00
Q Drive External 540MB	$369.00
Q Drive External 1080MB	$744.00
Q Drive External 1402MB	$999.00
PocketDrive 85MB	$212.98
PocketDrive 170MB	$341.98
PocketDrive 256MB	$424.98

Pinnacle Micro

RCD 1000 Recordable CD-Rom	$1,878.00
Sierra 1.3GB Optical	$2,199.00
Tahoe 230MB Optical	$879.98

PLI

Infinity 230MB Optical 3.5"	$999.98
Infinity MAX Optical 5.25 1.3GB	$3,098.00
Infinity 270 Turbo S	$537.98
Infinity 270 Removable Drive	$538.98

Sony

Sony Portable MD Data Drive	$599.98

Internal HD

Quantum 270MB	$269.00
Quantum 340MB	$234.00
Quantum Lightning 730MB	$309.00
Quantum 1GB	$659.00
Seagate 2.1GB Barracuda	$1,099.00

PowerBook HD

256MB 2.5 Drive	$305.98
340MB 2.5 Drive	$439.98

External HD

Quantum 270MB	$259.98
Quantum 340MB	$299.00
Quantum 540MB	$349.98
Quantum 1GB	$729.98
Seagate 2.1 GB Barracuda	$1,199.00

Removable HD

SyQuest 44/88MB w/o cartridge	$312.98
SyQuest 200MB w/o cartridge	$471.98
SyQuest 270MB w/o cartridge	$459.98

SCANNERS

Agfa

Arcus II	$2,729.98
StudioScan	$679.98
StudioScan II	$869.98

Epson

ES-1200C Pro Scanning System	$1,278.98
ES-1200C	$949.98
Action Scanning System ES-600C	$598.98

Fujitsu

Scan Partner Jr.	$449.98

Hewlett-Packard

ScanJet 3P	$484.00
ScanJet IICX	$937.98

Microtek

ScanMaker IIG	$329.98
35T Slide Scanner	$934.98
Automatic Document Feeder	$359.00
ScanMaker II	$449.98
ScanMaker IIHR	$1,037.00
ScanMaker III	$2,486.00
ScanMaker IISP	$499.98

Nikon

ScanTouch Flatbed	$1,149.00
Coolscan	$1,349.00

Polaroid

SprintScan 35mm	$1,999.00

Relisys

Reli 2412 LE	$579.98
Reli 4800 w/Photoshop 3.0	$1,559.00
Reli 9624T w/Photoshop	$1,899.98

Umax

Vista-T630 Scanner	$498.98
UC 1260 Pro w/Full Photoshop	$949.98
BuCard Reader for Mac	$229.98
Vista S6 Pro w/Full Photoshop	$779.98
Vista S8 Pro w/Full Photoshop	$893.98
Powerlook	$2,999.98

INPUT DEVICES

Alps

Alps Glidepoint for Mac	$70.98

Calcomp

Drawing Slate 12x12 Cordless 4B Cursor	$224.98
Drawing Slate 6x9 w/ Fractal Painter 3.0	$489.98
Drawing Slate II 6x9 w/Pressure Pen	$209.98
Drawing Slate II 12x12 w/Pressure Pen	$249.98
Drawing Slate II 12x18 w/Pressure Pen	$319.98

Logitech

Trackball Mouse	$89.98
TrackMan II	$68.98

Wacom

UD1212R w/Fractal Painter 3.0	$769.98
ArtZ 6x8 Graphics Tablet	$279.98
ArtPad 4x5 ADB Graphics Tablet	$134.98

CD-ROM/MULTIMEDIA

NEC

NEC 3XP Plus CD-ROM	$384.98
NEC 2V CD-ROM	$224.98
NEC 4Xe CD Rom Drive	$479.98
Plextor 4Plex CD-ROM	$512.98
Performance Mini 2X CD-ROM	$175.98
Performance 4x Quad CD-ROM	$340.00

Sony

4X Speed CD-Rom CSD-7611	$299.98
SRS-D4K Speakers w/Subwoofer	$199.98
Computer Speaker System CSS-B100	$94.98
SRS-D2K Speakers w/ Subwoofer	$134.98

PRINTERS

Advanced Logic Integration

VersaLink	$234.98

CoStar

LabelWriter XL	$146.98
LabelWriter XL Plus	$226.98

Digital Equipment

DEClaserwriter 1000	$3,899.00

Epson

Stylus Color Ink Jet Printer	$588.00

Fargo

PrimeraPro	$1,379.98

Hewlett-Packard

HP DeskWriter 320	$308.00
HP DeskWriter 540	$299.98
HP ColorKit for 540/320 Printers	$35.98
HP DeskWriter 560C	$480.00
HP LaserJet 4ML	$999.00
HP LaserJet 4M Plus	$1,956.00
HP LaserJet 4Si MX	$4,204.98
HP LaserJet 4MV	$2,824.00

Momentum

Font Juggler	$84.00

Nikon

CoolPrint	$1,539.98

Texas Instruments

MicroWriter PS23	$599.98
MicroLaser Pro 600 PS23	$1,196.98
MicroLaser Pro 600 PS55	$1,523.00
MicroLaser Power Pro	$1,828.00
MicroLaser Pro E	$1,369.00

POWER BACKUP

APC

APS Personal Surge Arrest	$18.98
APS Personal Surge Arrest w/Phone	$29.98
BackUps 280	$99.98
BackUps 400	$148.98
BackUps 600	$259.98

Tripp Lite

Tripp Lite BC 250 UPS	$98.98
Tripp Lite BC 400 UPS	$149.98
Tripp Lite BC 500 UPS	$188.98

MEDIA

Bernoulli Cartridges

Bernoulli 90MB Cart	$85.98
Bernoulli 230MB Cart	$97.98

SyQuest Cartridges

SyQuest 44MB Cart Unfo	$41.98
SyQuest 88MB Cart Unfo	$47.98
SyQuest 105MB Cart Unfo	$57.98
SyQuest 200MB Cart Unfo	$76.98
SyQuest 270MB Cart Unfo	$61.98

Zip Drive Cartridges

Iomega Zip 100MB Cart Unfo	$19.98

MOBILE COMPUTING

Targus

Notepac (5 color choices)	$29.98
Universal Notebook Case	$59.98
Leather Notebook Case	$89.98

MEMORY UPGRADES

CALL FOR PRICING

Only $339

TDK 28.8 PCMCIA Modem Card

- 28,800 bps data, 14,400 bps send and receive fax
- Internal phone line interface electronics (DAA)
- PCMCIA approved 7 pin I/O connector
- Guaranteed compatible with your Apple PowerBook Series 500 computer
- Compatible with V.Fast Class and slower modems

TDK #91807

Only $1799

Pinnacle RCD-1000 Recordable CD System

- Record, distribute and playback multimedia and audio CDs!
- Built-in 1MB cache buffer
- Double-speed write for faster recording

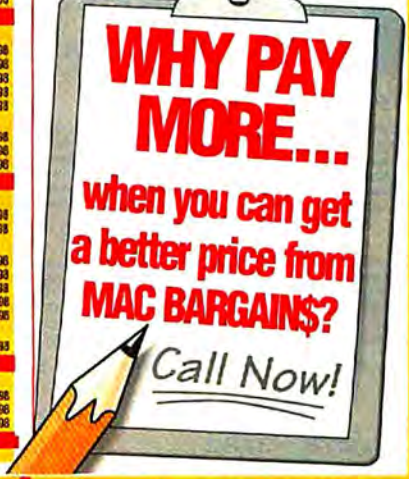
Pinnacle Micro #92403

Only $998

EAsyColor 24/1152 Accelerated Video Card

- Advanced LSI RISC processor
- Resolutions as high as 1152x870 pixels
- 24-bit color support with on-board CMYK-RGB acceleration
- Features 4MB of VRAM for high speed image access at higher resolutions
- Lifetime warranty

EA Research #92427



DI$COUNT PRICE$ ON QUALITY HARDWARE, $OFTWARE & ACCE$$ORIE$

IF YOU DON'T SEE IT... CALL!

MAC BARGAIN$

FAX: 1-206-603-2520 INT'L PHONE: 1-206-603-2558

15815 S.E. 37th Street, Bellevue, WA 98006-1800

Knowledgeable Sales Advisors help make buying easy!

Please mention this source code when ordering: BW507

©1995 MZI, Inc. Bellevue, WA ™Trademarks of all companies listed in this ad. All rights reserved.

Circle 70 on reader service card

COMPU.D
International, Inc.

1-800-929-9333

Best Price Guaranteed!

PowerMacs

		Lease
8100/110 72/2GB CD	$6,400	$228
8100/110 8MB No HD	$3,995	$142
8100/100 8MB No HD	$2,799	$99
8100/100 16/2GB CD	$3,950	$141
8100/100 AV 16/1GB CD	$4,199	$149
8100/100 AV 72/2GB CD	$5,599	$199
8100/80 16/1GB CD	$3,799	$135
7100-80 8/700 CD	$2,899	$103
7100-80 AV 16/1GB CD	$3,699	$132
7100-66 8/500	$1,699	$60
7100-66 AV 8/500	$2,099	$75
6100-66 8-350/16-1GB	$1579/2199	$78
5200-75 8-500 CD	CALL	CALL
Quadra 950 / 840AV	8-230/2895/2895	$96

PowerBooks

		Lease
540C 20-500 w/ Modem	$3,975	$142
540C 12-320 w/Modem	$3,399	$121
540C 12-500 w/Modem	$3,699	$132
540C 4-810/320	$3,149/2,695	CALL
520C 4-160/320	$1,899/2,099	$76
520C 12-320 w/Modem	$2,699	$96
520/520C 4-0 No HD	$1,299/1,799	$47/64
520 4-160/320	$1,425/1,650	$50/59
150 4-120	$999	$40
Duo 270/280/280C	CALL	CALL
Express Modem (Not for DUO)	$79	CALL

Call for all other Systems, Parts & Accessories.
Lease prices are approximate based on 36 months (on approved credit).

Performa 630 w/FPU 4/250MB $899

68040, 33Mhz, 1MB Video RAM , with Software Bundle(ClarisWorks, Aldus DateBook & Touchbase Pro Bundle, Clip ART, At Ease 2.0 & MAC PC Exchange

Printers & Monitors

LaserWriter 16/600P	$ 1,895
LaserWriter Select 360	$ 1,190
Laser 810 600dpi, 20ppm	$2,879
Kodak 450GL Digital	$395
Apple 15"/17"	$399/869
14"+/14"RGB	$279/379
220Volt Printers/Mon.	CALL

Quantum

3.5" SCSI Hard Drive	Internal	External	2.5" SCSI Hard Drive	Internal	External
FireBall 540, 540MB	$199	$249	Daytona 340, 340MB	$230	$299
FireBall 1080, 1.08GB	$425	$475	Daytona 514, 514MB	$379	$435
TrailBlazer 850, 850MB	$299	$349	Toshiba MK2626FB, 810MB Int.		$530
Atlas 2100, 2.1GB	$850	$899	Internal Drives come packaged with FWB software.		

radius

Monitors & Cards

Radius Rocket Accelerator	$149	Thunder IIGX 1152	$999
Pivot Color /TPD Interface	$199/99	Thunder IIGX 1380	$1,095
SuperMac 17T 17" Trinitron	$699	Thunder IIGX 1600	$1,499
17T / 17" Reconditioned	$525/399	Thunder IVGX 1152	$1,899
PresView 21T/17T	$2999/1799	Thunder IVGX 1360	$2,199
SuperMac 20" Clr +	$999	Thunder IVGX 1600	$2,599
20" Hi-Res. Trinitron	$1399	Thunder 24GT/II Light	$1,299/599
E-Machine E-20	$999	Thunder Storm/Storm Pro	$199/299
IntelliColor 20i/20e	$1399/1849	Thunder II Upgrade	$299
Radius Precision Color Pivot	$349	Color Card 24 Accelerator	$99
Radius Mono Full Page	$199	Lemans GT	$799
Radius Mono/Grayscale. 20"	$499	Precision Color Pro 24XP/24XK	$199/299
Radius Mono/Grayscale. 21"	$599	Precision Color Pro 24X	$499
Radius Precision Color 21"	$1399	VideoVision Studio 2.0	$3,349
SuperMac 21" Color	$1299	VideoVision Studio	$2,599
Display Calibrator Pro	$549	Spigot Power AV/Spigot II Tape	$729/299
Display Calibrator	$299	Spigot & Sound	$199
Spectrum Power DSP Upgrade	$199	Video Spigot	$99
Spectrum 8 LC/8 Series II	$299/149	Video Spigot SI/Pro SI/LC	$99/299/199
Futura IISX/IILX	$199/399	Spectrum 24 PDQ+/8.24 PDQ	$399/149
Futura Ultra SX/LX	$149/599	Spectrum 8.24 PDQ F/IISI	$199

TRUEVISION TARGA 2000

Video *Capture & playback card from Truevision delivers the highest quality video available in a desktop system.* **$4099**

Polaroid SprintScan 35

SCAN 35mm *slides up to 2700 dpi . Includes Adobe Photoshop utility for Mac & TWAIN drive for WINDOWS.* **$1825**

Tablets WACOM Tablets

ArtPad 4x5	$149	UD-12x18	$599
ArtZ 6x8	$285	UD-12x18 Electro	$710
UD-12x12	$465	Fractal Design Painter	$225

Scanners UMAX Scanners

The Magic of Color

630-OA1, 600x300, greyscale	$279	1200SE, 4800x4800, 30-bit,	$1199
UC-630, 1200x600, 24-bit	$469	PowerLook, 9600x9600, 30-bit,	$2099
Vista T-630, 4800x4800, 24-bit	$499	Transparency Adapter	$389
Vista S6, 4800x4800, 24-bit	$579	Photoshop LE, OmniPage Direct	$75
Vista S9, 6400x6400, 24-bit	$749	Full Photoshop, Kai's Tools Lite	$190
UC-1260, 2400x1200, 24-bit	$789	Full Photoshop, OmniPage Direct	$180

SOFTWARE

Adobe Illustrator 5.5	$325	Fractal Design Painter	$249
Adobe Photoshop 3.01	$499	Microsoft Excel 5.0	$225
Adobe PageMaker 5.0a	$399	Microsoft Office 4.2	$375
Apple PhotoFlash 1.0	$15	Microsoft Word 6.0	$225
QuarkXpress 3.31 Mac	$599	OmniPage Direct	$49
QuarkXpress 3.31 PowerMac	$649	WordPerfect 6.1	$225

Dealers & Resellers Call For Price List Fax Back.

DISCOVER MasterCard VISA

Sales (818)787-3282 **Fax** (818)787-5555
Dealers (818)780-9457 **Export** (818)787-0816
Internet Address: 74673.1503@COMPUSERVE.COM

All Prices Are Based on C.O.D. Order & Subject To Change!

Circle 84 on reader service card

Small colleges can help you make it big.

Just ask: Michael D. Eisner—Chairman/CEO, The Walt Disney Company, Denison University, Ohio; William C. Springer—President, Heinz North America, Gannon University, Pennsylvania; Donna Wolf Steigerwaldt—Chairman of the Board/CEO, Jockey International, Inc., Colorado College, Colorado; James W. Near—Chairman/CEO, Wendy's International, Hanover College, Indiana; John W. Johnstone, Jr.—Chairman, President & CEO, Olin Corporation, Hartwick College, New York; William V. Roberti—President/CEO, Brooks Brothers, Sacred Heart University, Connecticut.

Some of our country's most successful people went to small colleges where size, faculty, and curriculum combined to give them the education, skills, and confidence to make it big in today's world.

A small college can help you make it big, too. To learn more about small independent colleges, contact: Council of Independent Colleges, One Dupont Circle, Suite 320G, Washington, D.C. 20036.

Sponsored by CIC The Council of Independent Colleges

QUADRA BLOWOUT!

Quadra 605/LC 475 4/0

$599!

- **50/25MHz 68LC040 Processing Power**
- Ready for PowerPC Upgrade
- Built in video supports color monitors up to 21"
- 4MB RAM, (expandable to 36MB)
- Apple 1-year Warranty
- Supports Stereo Sound
- Multimedia Ready—Just plug in CD-ROM

"It's hard to go wrong buying one... Never before has Apple offered so much performance for so little money" -Macworld-

LOWEST PRICE EVER!!

FREE COPY OF ClarisWorks!! when you purchase the Q605 or LC475 and Starter Kit ...while supplies last! (a $149 Value!)

SPECIAL DEAL!

UPGRADE your LC, LC II, or LC III to the Quadra 605 **$399!!**

VALUE BUNDLES

Value Starter Kit ONLY **$249!!**
- Apple Design Keyboard
- Apple 250MB Internal Hard Drive

Multi-Media Kit ONLY **$249!!**
- Stereo-Powered Multimedia Speakers!
- Microphone!
- Three HOT multimedia CD-ROM titles!
- External Double Speed CD-ROM Drive!

Multi-Media Kit add-ons:

3x External CD-ROM drive	Add $49
10-CD MEGAPAK (instead of 3) games, reference, adventures, etc.	Add $49
CharisMac CD cache software (accelerates drive performance up to 4X)	Add $19
Upgrade to Apple Microphone	Add $10

MORE MAC DEALS

CPUs Bought/Sold, New & Used Trade-ins Accepted!

Classic 4/40	$349	Quadra 630 4/250	$999
MAC IIsi 5/80	$499	Quadra 840AV	$CALL
MAC IIci	$599	Quadra 950	$CALL
		Apple Group Server 95	$4999

INCREASE NETWORK SPEED UP TO 10 FOLD
32MB/2 gig Dat tape back-up. Appleshare Pro
Grab this one while supplies last! Dealer cost $9290

CALL! FOR POWER MACINTOSH PRICING

COMPLETE Mac system
only **$149!!**
Mac Plus With Keyboard and Mouse

CRA SYSTEMS, Inc. 800/375-9000

All quantities are extremely limited and will be sold on a first come first served basis.

COLOR PRINTERS

360 dpi Star Printer

The SJ-144MC provides full color and monochrome laser quality printing for half the price of other color printing options!

Retail $599 Quantities limited!
"...breakthrough product because of its technology as well as its price."... MacWeek

$249!

Compare the Value

	STAR SJ-144MC	Stylewriter 2400
360dpi	✔	✔
TrueType scalable fonts	✔	✔
Prints on plain paper and overheads	✔	✔
Advanced Heat Fusion printing, no ink jet smears!	✔	NO
Blazing 382cps in Laser Quality mode!	✔	NO
3 paper feed paths	✔	NO
Large 102KB print buffer	✔	NO
Price	**$249**	**$499**

Mitsubishi 6370-10u 300 dpi	$1999
QMS CS100 model 10	$1999
QMS CS100 model 30 11"x17"	$2999
QMS CS1000 600 dpi 11"x17"	$3999

MONO PRINTERS

1200dpi Upgrade-ready Tabloid Laser Printers ...from **$1999!**

QMS

GCC TECHNOLOGIES

QMS 860 Hammerheads from $1999

EDITORS' CHOICE: PC Magazine, MacUser
BYTE MAGAZINE: "judged the best for print quality."

- upgradeable to 1200 dpi, from 600dpi
- 11"x17" Full-bleed tabloid output
- Postscript level 2 and QMS Crown Technology for networks
- Fast, 8ppm Canon engine with 25MHz RISC processor

Apple Select 360 w/Toner (price includes Apple rebate)	$1149
QMS PS815 Adobe PS, 8ppm, 300dpi	$799
OEM Apple Laserwriter	$499
GCC WriteMove II 2 lb. portable, 360 dpi	$249
GCC SelectPress 1200	$4999

EXTRA VALUE ITEMS

Global Village Teleport Fax/Modem	$49
14.4k external fax/modem	$119
28.8k external fax/modem	$219
SuperMac Spigot LC with Adobe Premiere (lets you edit your family video)	$199
Surge Protector	$14
Kensington Turbo Mouse trackball	$69
Emachines SIMPLY TV	$399

SOFTWARE

Photoshop Deluxe Edition (v2.5)	$299
Quark Express for Windows v. 3.1	$299
Adobe Premiere with computer or video purchase	only $99
Aldus Fetch multimedia database	$49
Lotus 1-2-3 for Mac	$49

FOR A FULL LINE OF MONITORS AND VIDEO CARDS...SEE NEXT PAGE!

Dealers and consultants, call for quantity pricing. We ship worldwide. Monday thru Friday 9 a.m. to 8 p.m. CST Saturday 10 a.m. to 4 p.m. CST Sales Department Only Prices reflect cash discount. Not liable for typographical errors.All shipping charges for COD orders to be secured by credit card. (Se hace pedidos internacional. Nous acceptons des commandes internationales. Internationale Handlerkonditionen.)

CRA Systems, Inc.
Domestic Sales 800.375.9000
Fax 817.754.2345
Consultants/Dealers 817.754.2131
International Sales 817.754.2120
300 South 13th St., Waco, TX 76701

AWARD WINNING PRODUCTS

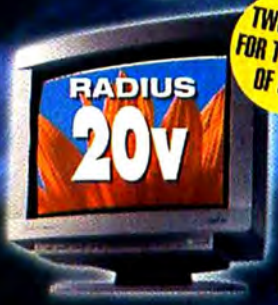
CRA SYSTEMS, INC. 800/375-9000

TWENTY ONE INCH DISPLAYS

Radius PrecisionColor Display 21 $1499*
- Microprocessor controls • 1600x1200 to 1024x768
- Flat screen • Razor sharp .28 dot pitch
Ideal solution for professionals requiring maximum screen area, color accuracy, and razor sharp images.

*With qualifying videocard, accelerator, or computer purchase

SuperMac PressView 21	$2899
Radius 21 inch Grayscale Display	$799
RasterOps 21 inch Grayscale Display	$899



TWO PAGES FOR THE COST OF ONE!

Retail $1999
$999*
Best Screen Uniformity!

TWENTY INCH DISPLAYS

20 INCHES FOR THE COST OF 17!

While Supplies Last!—Your Choice of...

Radius PrecisionColor Display 20v $999*
- Multiple resolutions1280x1024 to 640x480
- Mac/PC compatible
- Works with most any Macintosh built-in video
- "Best Overall Screen Uniformity" – MacUser

SuperMac or E-Machines 20 $999*
- 1152x870 to 1024x768 • Flat screen
- Shadow Mask Tube • Built in video support

*With qualifying videocard, accelerator, or computer purchase

Retail $2399
$1699*
#1 Selling 20" Trinitron!

Radius 20 inch Grayscale Display $699

Radius IntelliColor Display 20e $1699*
Limited Quantities!
- Top rated 20" Trinitron, Best Money Can Buy
- MacUser, MacWorld, and MacWeek Editor's Choice
- 1600x1200 to 640x400 • Microprocessor Controls

*With qualifying videocard, accelerator, or computer purchase

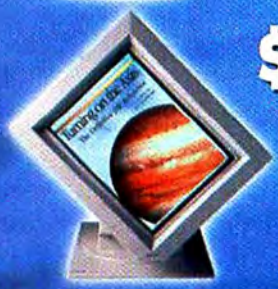
Retail $1299
$699*
Editor's Choice!

SEVENTEEN INCH DISPLAYS

SuperMac/E-Machines T16IIMR $699*
Limited Quantities!
- High Grade Studio Trinitron Series
- .25mm multi-resolution • Editors Choice
- Microprocessor Controls • 1024x768 to 640x480

SuperMatch 17T	$799*
Radius PrecisionColor Display 17	$CALL

*With qualifying videocard, accelerator, or computer purchase



$399
With purchase of video card.
We have cards for SE/30, LC, IIsi, Nubus, and Quadras

PIVOT DISPLAYS

Radius Color Pivot LE	$399
Precision Color Pivot	$599
Grayscale Pivot	$399
Radius Full Page Display	$299

$599*
MacWorld-★★★★
"It's hard to go wrong buying one..."
Upgradable to PowerMac

Radius PhotoBooster $199*
Retail $999
- Features twin AT&T 3210 66MHz DSPs • Accelerates Photoshop Filters • Up to 10x faster than a Quadra 950
- MacUser Editor's Choice

PhotoShop Deluxe Edition $299

Thunder DSP Daughterboard $299

PhotoEngine $CALL

Radius PowerView $199
Allows most PowerBooks and the Classic II to support displays and projectors.

SuperMac SuperView $299
Similar to Radius PowerView but also supports TV!

CRA Systems, Inc. full one year warranty. All quantities limited and sold on a first come first serve basis.

radius™

SUPERMAC™

MACINTOSH QUADRA BLOW OUT!

Macintosh Quadra 605/LC 475 4/0 $599*
- Lowest price ever! • NEW with 1 year warranty!
- 50/25 MHz 68LC040 processing power • PowerMac upgradeable
- Built-in video supports up to 21" color monitors
- 4MB RAM with Burst-Mode access (expandable to 36MB)
- Supports stereo sound • MultiMedia ready–Just plug in CD-ROM

*CPU Only

"Never before has Apple offered so much performance for so little money"
— MacWorld

UP TO EIGHTY PERCENT OFF!

Radius 24XP
$199

24 BIT VIDEO
MILLIONS OF COLORS!
Buy 256 colors for $199 and get 16 million free!

Finally a 24 bit video solution for the price of 8 bit. Upgrade to the industry standard with photorealistic color in applications such as Adobe Photoshop, Illustrator, PageMaker, and others. Even games, CDs, and most business applications such as Microsoft Word and Excel currently support millions of colors (24 bit). All cards available in limited quantities only. First come first serve.

21" RESOLUTIONS

24 BIT	Radius PrecisionColor 24X	$599
	Radius PrecisionColor Pro 24X	$699
	All Thunder IV's	$CALL
	All Thunder II's	$CALL
	SuperMac Ultura LX with DSP acceleration	$1299
	RasterOps Horizon 24	$1499
	RasterOps 24XLTV	$1499
	RasterOps PaintBoard Pro	$899
	RasterOps PaintBoard Turbo XL	$699
	RasterOps Prism GT	$CALL
8 BIT	Radius PrecisionColor 8XJ	$399
	SuperMac DoubleColor LX	$399
	SuperMac Spectrum 8/24 PDQ	$399

20/19" RESOLUTIONS

24 BIT	SuperMac Spectrum 24 Series V	$599
	Radius PrecisionColor 24XK	$499
	Radius PrecisionColor Pro 24XK	$599
	SuperMac Futura MX	$499
	RasterOps PaintBoard Lightning	$499
	RasterOps Prism 24	$CALL
8 BIT	SuperMac Spectrum 8 Series III	$199

17/16" RESOLUTIONS 24 BIT

Radius PrecisionColor 24XP	$199
Radius PrecisionColor Pro 24XP	$CALL
SuperMac Futura SX	$299

APPLE VIDEO CARDS

Apple 8•24	$399
Apple 8 Bit	$99

CRA SYSTEMS

Monday thru Friday 9AM to 8PM CST
Saturday 10AM-4PM *Sales Department Only*

Domestic Sales 800.375.9000
Fax 817.754.2345
Consultants/Dealers 817.754.2131
International Sales 817.754.2120

Se hace pedidos internacional.
Nous acceptons des commandes internationales.
Internationale Handlerkonditionen.

Prices reflect cash discount. Not liable for typographical errors. All shipping charges for COD orders to be secured by credit card. Dealers and consultants call for quantity pricing. We ship anywhere.

800/375-9000
CRA Systems, Inc.
300 South 13th St., Waco, TX 76701

Circle 20 on reader service card

68040 Accelerator BLOW OUT!

$299** from

Radius Rocket 33MHz w/FPU	$399**
Radius Rocket 40MHz w/FPU	$499**
Stage Two Rocket 40MHz w/FPU -includes SCSI II Booster and RocketShare	$899
SCSI II Booster (up to 4x faster)	$249
PhotoBooster for Rocket	$299
RocketShare	$299

**With purchase of any Rocket peripheral

MULTI MEDIA

Spigot II Tape $499
Full Motion Video – Lowest Price Ever!

VideoSpigot Card from $99*
retail price $599

VideoVision Studio Upgrade	$CALL
VideoVision Studio	$CALL
VideoVision Studio Array	$CALL
VideoSpigot Nubus/LC/IIsi	$99*
Spigot and Sound/VideoSpigot Pro	$299/399
MacRecorder	$149
Adobe Premiere	$99**

**With computer or video purchase *With purchase of Premiere*

PRINTERS

COLOR PRINTER ONLY $299
with 5 free cartridges!

Star SJ-144MC 360 dpi
"A breakthrough product because of its technology as well as its price!" — MacWeek
retail price $599 ...only $249 with computer purchase
Compare with $499 Apple Color StyleWriter 2400 —
- Advanced Heat Fusion printing-no ink smears — only Star
- Blazing 382 cps in Laser Quality mode! — only Star
- Large 102KB print buffer — only Star

• BYTE's Best of Comdex- Byte Magazine • 'Best Buy'- Printers Buyers Guide and Handbooks • Compute's Spring Comdex Top Ten Award

TABLOID LASER PRINTER from $1999
QMS 860 Hammerhead 600-1200 dpi
- Full-Bleed 11"x17" output • PostScript Level 2
- 8ppm heavy-duty Canon engine

GCC WriteMove II *portable printer only* **$199***
MacUser ★★★★½ • *MacUser— 4 1/2 mice*
• *MacWeek — ★★★★*
*with CPU purchase

GCC SelectPress 1200 $4999
- 1 year factory warranty • true 1200x1200 dpi resolution for camera ready output • 12"x19" tabloid printing • 270MB internal hard disk
- 285 PostScript fonts • *"Best Output" – MacUser*

MacUser ★★★★½ *"Produces consistently good output" – Seybold Reports*

Apple LaserWriter Select 360 $1149*
• includes Toner • *"a terrific bargain" – MacUser* • *After rebate

OEM Apple LaserWriter $499

DV EXPO

CD-ROM EXPO

DV EXPO AND CONFERENCE

- For Advertising Agencies, Production Houses or any organization or individual who wants to get involved in Digital Technology and needs to know what all the components are and how to put them all together.
- Plan your strategy based on first-hand information from industry leaders.
- See the hottest digital video tools on the exhibit floor and learn how to use them.
- From hands-on workshops to in-depth discussions of technical issues and industry standards, the conference program will cover the tools, the content and the delivery of digital video by the professionals using it successfully today.

TWO GREAT EVENTS IN ONE NEW LOCATION!

NEW EVENT
DV Expo and CD-ROM Expo

NEW DATES
Exhibits: November 29-30, 1995
Conferences: November 28-30, 1995

NEW LOCATION
New York Hilton Hotel & Towers
New York, New York

CD-ROM EXPO AND CONFERENCE

- For Publishers, Marketing Directors, New Product Developers, or anyone seriously pursuing CD-ROM as a distribution medium.
- Find out answers to critical issues such as: What programs are most suitable for CD-ROM distribution? How can you maximize your CD-ROM product's marketability? What are the steps and costs involved in publishing a top-quality CD-ROM?
- Explore the nation's most comprehensive Expo dedicated to CD-ROM technology—save months of research time.
- Learn firsthand from leading industry experts about a wide variety of CD-ROM applications, including training, sales, marketing, advertising, technical support and documentation, archiving and much, much more!

DV EXPO

sponsored by DV

CD-ROM EXPO

sponsored by CD-ROM

FOR MORE INFORMATION CALL 1-800-945-3313

Send me more information on DV Expo and CD-ROM Expo.

I am interested in: ❑ Attending ❑ Exhibiting

Name _____ Title _____

Company _____

Address _____

City/State/Zip _____

Phone _____ Fax _____

Mail to: Mitch Hall Associates, 260 Milton St., Dedham, MA 02026
Or Fax to: 617-361-3389 Phone: 617-361-8000

MACWORLD

Before you upgrade your system, how about upgrading your brain?

MACWORLD EXPOSITION

Sure, you could use more computer power. But don't forget that knowledge is power too.

Maybe you should come to MACWORLD Expo for a chance to pick up some new applications, or to invest in new hardware at the bargain prices you'll find there.

Or, maybe not.

Maybe you should just come to experience the new and to learn.

You'll have plenty of opportunity to find out everything you ever wanted to know about the state of Macintosh technology, and what you can do with it. Hundreds of exhibiting companies, thousands of experts and dozens of conferences and seminars will fill your head with wild ideas – and the skills to make them happen.

MACWORLD Expo is coming to **San Francisco** and **Boston.** That's two opportunities for an upgrade. So think about it. Then plan on attending now.

Please send me more information on MACWORLD Expo.
I am interested in: ❑ Exhibiting ❑ Attending
❑ Boston ❑ San Francisco

Name _____

Title _____

Company _____

Address _____

City/State/Zip _____

Phone _____ Fax _____

Mail to: Mitch Hall Associates,
260 Milton Street, Dedham, MA 02026

Or Fax to: 617-361-3389 Phone: 617-361-8000

Macworld

PRODUCT INDEX
BUSINESS TOOLS

Macworld SHOPPER®

PRODUCT INDEX

Category	Page No.
ACCESSORIES	.235
Covers	
BUSINESS TOOLS	.208-210
Bar Code	
LCD Panels	
Medical	
Point of Sale	
Presentation	
Real Estate	
EDUCATIONAL & RECREATIONAL	.230-232
Astrology	
Discount Software	
Genealogy	
Grading	
Music	
Religion	
GRAPHICS	.232-234
CD ROM Photos	
Clip Art	
MULTIMEDIA & CD-ROM	.232
3D Modeling	
NETWORKING & COMMUNICATIONS	.229
BBS	
PROGRAMMING & UTILITIES	.234
Data Compression	
Languages	
SERVICES & SUPPLIES	.234-235
Computer Insurance	
Computer Repair	
Data Recovery	
Slides	
SYSTEMS & PERIPHERALS	.210-223
Switch Box	
UPGRADES & MEMORY	.224-229
Memory Upgrades	

ACCOUNT MANAGERS: 800.888.8622

Carol Johnstone 415.978.3152
Shannon Smith 415.974.7414
Niki Stranz 415.978.3105

DTP COORDINATOR:

Clayton Haberman 415.978.3132

Active Buyers turn to Macworld, the Macintosh authority, to find the products they need.

Call 800.888.8622

Macworld Shopper Delivers

LIMITED ADVERTISING BUDGET?

Macworld Shopper offers a great way to reach 650,000 active shoppers.

Project Wall-Sized Multimedia
Only $3,799.

SPECIAL OFFER!

Introducing the BOXLIGHT ProColor 1500 Multimedia Projection Panel. Full-color, big-screen multimedia and video projection with built-in audio! Industry-leading performance at special introductory price of only $3,799!

- Active-matrix color
- Built-in video & audio
- Rugged & portable
- PC & Mac Compatible
- Unbeatable price

Your direct source for all the bright answers.
- Widest selection
- Instant availability
- Overnight shipping
- 30-day guarantee

BOXLIGHT™ CORPORATION

12771 Fjord Dr. N.E., Poulsbo, WA 98370
206/779-7901 • Payment: VISA, MasterCard, American Express, COD and Purchase Orders (some restrictions). Leasing and rental options available. 30-Day Money-Back Guarantee.

Call Today 1-800-762-5757

CIRCLE 423 ON READER SERVICE CARD

The Bar Code Innovators

TPS Firsts

- '76 TPS Invents the Bar Code Keyboard Wedge
- '81 First PC Keyboard Wedge
- '84 First Keyboard Wedge for Mac
- '87 First Macintosh ADB Keyboard Wedge
- '92 First Integrated Laser for Macintosh
- '94 First Newton Bar Code Readers

Integrated Macintosh Keyboard Laser	$795	Bar Code Pro "All" Software	$325
Macintosh Laser and Wedge Combo	$595	Bar Code Pro "UPC" Software	$195
CCD Keyboard Wedge for Mac	$295	SuperDisk Bar Code Fonts	$75
MobileWand Newton Bar Code Reader	$269	Postnet Fonts	$49

Integrated TPS Nomad Cordless RF Laser and Base $1995

30-Day Money Back Guarantee - Industry Leading Warranties
Toll Free Technical Support

Call Us Toll Free (800) 526-5920

AMERICAN EXPRESS · MasterCard · VISA · FEDERAL EXPRESS

TPS Electronics — A MEMBER OF IAM USA

prices subject to change without prior notice
International (415) 988-0141 Fax (415) 988-0289
INTERNET: barcode@com.com

CIRCLE 441 ON READER SERVICE CARD

Creating precision bar codes is as easy as using a font!

PRINTBAR™
BAR CODE FONTS

- Compatible with virtually any Macintosh application.
- Choose from: • UPC/EAN/ISBN • Code 39 • Interleaved 2 of 5 • POSTNET/FIM.
- 90-day money back guarantee.
- *"This is the best product of its kind, and it's reasonably priced too"* —MacUser review ★★★★½

EXTRA BONUS FREE POSTNET & FIM *with any PrintBar Font purchase*

Bear Rock TECHNOLOGIES

4140 Mother Lode Dr., Ste. 100, Shingle Springs, CA 95682
916 672-0244 · Facsimile 916 672-1103

Scanning bar codes is even easier!

CODESCAN 3000™
BAR CODE READER

- Comes complete with wand and 5 year warranty.
- Scans information directly into software application.
- Available with laser gun, CCD, badge slot, magstripe options.
- No software required. Ready to use in minutes!
- Money back guarantee.

New model now available!

Call the Bar Code Experts

800 232-7625

Internet Quick-Start Macintosh Kit
Get on the Internet simply & quickly!
Just $35 Includes:

- Step-by-step manual on how to install, configure, & use the Internet software & access the Internet.
- Free time on Internet using 800#!
- Complete Internet intro. software: WWW, Gopher, FTP, email, News, & modem app.; built-in SLIP/PPP!

Mail-in orders: *LionWrite Publishing*
4095 Sunridge Road
Pebble Beach, CA 93953
(408) 625-2539 for phone orders
(408) 625-9060 for Fax orders
Mastercard and Visa accepted

A lifesaver for problem files

CanOpener ~~$125~~ **$59**

Emergency access to all your Mac files!
Recover data from damaged files.
Read files your Mac can't open.
Search for missing information.
Grab text & pictures from any file.
Browse files fast. A lifesaver!

NEW Version 3.0! Supports PowerMac NATIVE! Reads over 25 picture formats · including DOS and Windows!

FREE SHIPPING!

Order TOLL FREE **1-800-552-9157**
or FAX to 914-747-9115 or MAIL check to:
ABBOTT SYSTEMS 62 Mountain Rd. Pleasantville, NY, 10570

CIRCLE 413 ON READER SERVICE CARD

SAVE BIG ON WP!

If you need a word processor, but don't need a zillion expensive features, you can save a ton of money by buying..

Scorpio!

It supports FULL COLOR, spell checks, runs on all color Macs, and is NATIVE on PowerMacs! And the price is an amazing.. **$19.95**

(less than the sales tax on some WP programs!)

PLUS you also get.. **FREE SHIPPING!**

Order TOLL FREE **1-800-552-9157**
or FAX to 914-747-9115 or MAIL check to:
ABBOTT SYSTEMS 62 Mountain Rd. Pleasantville, NY, 10570

CIRCLE 431 ON READER SERVICE CARD

Join the Mac-Barcode® Family!

The Only Complete Barcoding System with Friendly Support from the Experts.

Mac-Barcode ProLabel Software
Intuitive & Easy to Use • Readable Codes Guaranteed
SmartScanner/SmartPen
Rugged & Dependable • No Decoder Box!
Thermal Transfer Printer
Industrial Strength • 203 or 300 dpi

Call for Literature & Free Demo Disk
800-733-7592
The Mac-Barcode Co.
FAX 617-934-6233

CIRCLE 562 ON READER SERVICE CARD

Bar Coding

- Portable & Non-Portable Readers
- Radio Frequency Readers
- PostScript Bar Code Fonts

800-345-4220

WORTHINGTON DATA SOLUTIONS

Credit Card
Authorization & Electronic Deposit Software

- **Save hundreds, if not thousands of dollars.**
- Automatically authorizes and deposits all credit card sales -- individually or in batches.
- Integrate with your sales system with AppleEvents, AppleScript & import/export.

MacAuthorize®

•Single and Multiple User Versions•
POS Credit Developers since 1981

800/483-5526 • 408/274-1110
Tellan Software, Inc

CIRCLE 480 ON READER SERVICE CARD

BAR CODE PRO™

Create EPS graphics for your desktop publishing documents. Call for a free demo disk and get the information you need to make an intelligent purchasing decision for Mac or Windows.

800.619.0399
718.499.6293
or fax
718.768.3997

0 012345 7

SYNEX

CIRCLE 450 ON READER SERVICE CARD

Fast Systems
Mail Order
800-508-4444
Tel. (508) 653-6911
Fax (508) 650-1872

Distribution
EES Companies, Inc.

Point-of-Sale

- *Order Entry*
- *Invoicing*
- *Fast Cash Retail*
- *Purchase Order*
- *Credit Card Processing*
- *Inventory Control*
- *Barcoding*
- *Multi-User*
- *Complete Systems Available*

Demo Available

CIRCLE 600 ON READER SERVICE CARD

ELECTRONIC MEDICAL RECORDS
You ARE ready for a computerized medical chart. CARE4TH® PRO will revolutionize your practice. A mature, reliable, doctor-designed program, it feels like a chart, yet is astoundingly powerful. Hundreds of your colleagues in 43 states already know this. Single/network versions, Mac/Native PowerMac, starting under $2800!
Med4th Systems, Ltd.
1165 West Green Tree Road
Milwaukee, WI 53217
414/351-1988
Fax: 414/351-1954

MacLandlord $399

- Property management & bookkeeping program
- Easiest-to-use
- Tracks tenants, vacancies
- Prints checks, receipts, notices
- Income & expense statements
- Handles multiple properties
- Free telephone support
- 30 Day money-back guarantee
- $199.0 for competitive upgrade

Labana Management Company
P.O. Box 2037
Dearborn, MI 48123
313/562-6247

The Experts Choice for Barcoding!

Bar Code Generation
MacBARCODA
With a colour option that works
The highest precision barcoding package available for the Mac.

For Sheet-fed Labels
Easy to use, prints any label with barcodes, text, graphics, numbers and dates. LabelDesigner

For Reel-fed Labels
Prints short-run labels on reels with barcodes, text, graphics, numbers and dates. Compatible with the full range of Zebra Printers. macthermal

Bar Code Readers
A complete line of bar code scanners starting at **$255**

Computalabel

Call toll free **800 289 0993**
28 Green Street, Newbury MA 01951, Fax 508-462-9198

CIRCLE 544 ON READER SERVICE CARD

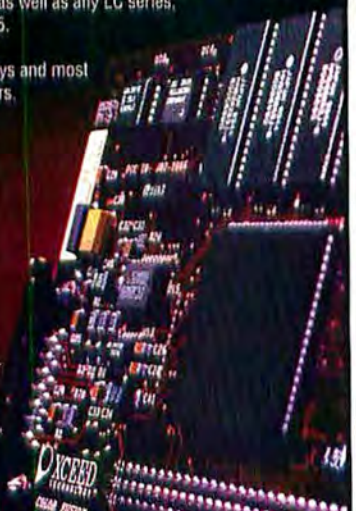
24-Bit Accelerated Graphics Card For Entry Level Mac's

Color Fusion™, from Xceed Technology, is a unique new graphics card that allows you to add a larger monitor, up to 21", with more colors or shades of gray, or add a second monitor to your Entry Level Mac. Color Fusion will enhance the video capabilities of any Macintosh using the LC style PDS slot, including Apple's new 630 family of low cost Multimedia workstations, as well as any LC series, Performa series, Color Classic or Quadra 605.

- Compatible with all current Apple displays and most any VGA, SVGA and Multi-Sync monitors.
- Maximum resolution of 1280 x 1024
- 30-day money back guaranty
- Easy installation
- 5-year registered warranty
- Estimated street price of $499.99

Ask your local dealer or a favorite mail-order company about Color Fusion, or call us direct at 1-800-XCEED-IT (800-923-3348) and ask for Ext. 407.

Even Little Mac's Deserve Big Color



XCEED TECHNOLOGY 48700 Structural Drive Chesterfield, MI 48051 810 • 598 • 8030 Fax 810 • 598 • 8005

CIRCLE 473 ON READER SERVICE CARD

Power Tools for the Power Presenter

One stop shop for all major brands

SALES • LEASES • RENTALS

COLOR from $1,795

For the latest in color projection panels and projectors call the experts in LCD technology. Your satisfaction guaranteed or your money back. Quick delivery via Fed-X or UPS.

Call for CATALOG 1 800 726 3599

Panelight DISPLAY SYSTEMS, INC.

101 The Embarcadero Ste. 100-A, San Francisco, CA 94105
Hours: 6:30 to 5:30 PST, 9:30 to 8:30 EST
VOICE: 415 772 5800 FAX: 415 986 3817

CIRCLE 578 ON READER SERVICE CARD

Take Control

Complete Systems Start at

$2,799

Taking control of your business is easy with a system that has been designed and proven by thousands of retailers just like you. POS•IM provides full POS and Inventory Management functionality with the features you need at an outstanding price.

POS•IM

Point-of-Sale • Inventory Management

Ensign Systems, Inc.

The One That Apple® Uses (800) 409-7678 (801) 546-1616

CIRCLE 417 ON READER SERVICE CARD

POINT OF SALE INVENTORY CONTROL

Software & Hardware for
- Retail
- Manufacturing
- Service Industry
- Kiosk Developers

New Bar Code Wand Only $225
Bar Code/Magnetic Stripe Readers
Receipt Printers • Cash Drawers
Credit Card Auth.& Deposit Software
New Electronic Catalog & Fax on Demand
call or fax for a FREE CATALOG
(800) 622-7670
(618) 985-8237 TEL • (618) 985-3014 FAX
Dealer Inquiries Welcome
30 day MBG
P.O.S. DIRECT

CIRCLE 466 ON READER SERVICE CARD

MAC SPOT

YOUR SPOT PRICE

POWER MACS

Power Mac 6100/66 8/0	1,369
Power Mac 6100/66 8/350/CD	1,699
Power Mac 7100/80 8/0	2,249
Power Mac 7100/80 8/500/CD	2,689
Power Mac 8100/100 8/0	2,769
Power Mac 8100/100 8/700/CD	3,199

PERFORMAS

Performa 630 4/250/FPU	749
Performa 575 8/250/CD	1,349
Powerbook 540C 4/320	3,099

WE ALSO CARRY APPLE PRINTERS, MONITORS AND KEYBOARDS.

1 800 680-1112

CIRCLE 482 ON READER SERVICE CARD

MEDIASTORE

Serving America's Data Storage Needs...For Less

RECORDABLE CD BLANKS
74 Minute $8.95

OPTICAL CARTRIDGES
128MB $17 230MB $21 650MB $45 1.3GB $53

SYQUEST CARTRIDGES
44MB $39 88MB $45 105MB $50 200MB $70 270MB $56

TAPE CARTRIDGES
Absolute lowest prices on 4MM, 8MM, and QIC call!

FWB Recordable CD 2X $1645

800-555-5551

CIRCLE 471 ON READER SERVICE CARD

Power Macintosh

Your best deal!

Power Mac 6100/66 8/350	1,489
Power Mac 6100/66 8/350/CD	1,699
Power Mac 7100/80 8/500	2,499
Power Mac 7100AV/80 8/700/CD	3,039
Power Mac 8100/100 8/700	2,999
Power Mac 8100/100 AV16/1000/CD	3,899
Performa 630 4/250/FPU	749
Performa 630 8/250/CD	1,049
Powerbook 540C 4/320	3,099

Apple PRINTERS

StyleWriter II	199
StyleWriter Color 2400	409
PLW 320	819
PLW 360	1,699
LW PRO 16/600	1,869

Apple MONITORS

14" Plus	279
14" AV	549
15" MULTISCAN	599
17" MULTISCAN	879
20" MULTISCAN	1,849

1 800 404-9976

MACNET

CIRCLE 543 ON READER SERVICE CARD

UNITED COMPUTER EXCHANGE

"A Global Network for buyers and sellers of used Macintosh equipment"

SELLERS'
No listing fee - Fast Turn Around!
BUYERS'
Quality Control - Large Selection

800-755-3033

Get the latest "Used Mac Price Index" available on: 24-hour FaxInfoline (404) 955-0569; United BBS (404) 612-0117

CIRCLE 478 ON READER SERVICE CARD

WANTED:

USED MACS!

BUY • SELL • TRADE

Top $ Paid Via FedEx Next Day Air!

Friendly, courteous service from the Pacific NW!

PACIFIC COMPUTER EXCHANGE
PORTLAND, OR

1-800-790-3881
FAX 503-239-8424

CIRCLE 451 ON READER SERVICE CARD

Complete Computer Packages · Monitors · Memory · Storage · Peripherals · Printers, and More!

NEC MICROTEK RasterOps

radius UMAX QMS

You Want to Go Places, We'll Help You Get There.

On the network, in your workplace, or at home, Computer Pros offers you the best deals on all the latest computer equipment. Competitive prices, selection and service for your laptop, notebook, desktop, and peripherals. Call us for the latest prices, and take advantage of our frequent flier bonus miles program.✈

☑ CPU's: Build Your Own Configuration

POWER MACINTOSH

Power PC 6100 /66 8/0	$1495.00
Power PC 7100/80 8/0	$2395.00
Power PC 8100/100 8/0	$3025.00
Power PC 8100/110 8/0	$4495.00

COLOR DISPLAYS

14" Color Monitors as low as	$ 299.00
17" Color Monitors as low as	$ 799.00
21" Color Monitors as low as	$1599.00

MEMORY

4 Megabyte SIMMS	$ 150.00
8 Megabyte SIMMS	$ 295.00
16 Megabyte SIMMS	$ 565.00

ACCESSORIES/HARD DRIVES

CD & Mounting Kit	$ 299.00
AV Cards	$ 450.00
Extended Keyboard	$ 75.00
1 Gigabyte Hard Drive	$ 495.00
2 Gigabyte Hard Drive	$ 945.00
4 Gigabyte Hard Drive	$1495.00

☑ Complete Packages

Performa 475 4/250, Color Monitor, Keyboard	$945.00
Quadra/Performa 630 4/250 fpu, Color Monitor, Keyboard	$1045.00

☑ Notebooks/Portables

PowerBook 150	$999.00
PowerBook 540 C 4/320	$2699.00
PowerBook 520 C 4/160	$2125.00

Prices reflect cash discount.
Prices subject to change

✈ Earn Flyer Mileage with Every Purchase! Call for Details

IBM · LaserMaster · Howtek · Newgen · Adobe
Hyphen · Micronet · P.L.I. · Hewlett Packard
Compaq · AST · Microsoft · AT&T · Panasonic
Epson · Toshiba · QMS · Texas Instruments · Radius
NEC · Raster Ops · Sony · and More!

COMPUTER PROS

1-800-319-4MAC (4622)

International Orders (305) 825-8709

MasterCard VISA Discover HEWLETT PACKARD FUJITSU TEXAS INSTRUMENTS Apple®

L O W E S T P R I C E S G U A R A N T E E D

Power Macintosh CPUs

6100/66 8/350	$1599
6100/66 16/1GB	$2395
6100/66 8/350/CD	$1799
6100/66 AV 8/350/CD	$2259
6100/66 16/500/CD DOS Com	$2495
7100/80 8/500	$2499
7100/80 8/700/CD	$2789
7100/80 40/700/CD	$3698
7100/80 av 16/700/CD	$3349
8100/100 8/700	CALL
8100/100 16/1GB/CD	CALL
8100/100 72/1000/CD	CALL
8100/100AV 16/1GB/CD	CALL
8100/110 16/2GB/CD	CALL
Q630 4/250	$979
Q650 8/500/CD	$2249
Q950 16/500	$3385

SAVE

Agfa Scanner & Software

Performa 6115CD	$2499
Performa 630 4/250 w/FPU, BundleSoftware, & G.V Fax Modem Free! (More & Kb Not Included)	$769

Agfa Scanner & Software

Agfa Studio Scan II LE	$889
Agfa Argus II Plus W/Transparency Adaptor & PhotoShop	$2695
AWS 6150 8/500/CD/A.S	$2895
AWS 8150 8/500/AppleShare	$4129
AWS 8150 16/1000/cd/DAT/As	$6195

Blow Out Models

PB 180 4/80 ref	$1579
APPLE CD 300e External	$298
Includes Grolier Encyclopedia CD & San Diego Animal Zoo CD	
Apple 21" Color .Ref	$1099
Apple 15" MultiScan	$459
LaserWriter Select 360	$1298
StyleWriter II Ref	$179
Portable StyleWriter	$229

PowerBooks

Free!

PB 150 4/120 w/ClarisWorks	$1299
PB 150 8/120/Mod	$1799
PB 520 4/160	$1599
PB 520 4/240	$1795
PB 520 8/160/Mod	$2059
PB 520c 4/160	$1949
PB 520c 4/240	$2195
PB 520c 12/320/Mod	$2898
PB 540c 4/320	$2988
PB 540c 12/500/Mod	$4195
PB 280c 4/320	Call
Duo 280c 12/320/M	Call
Duo Dock w/230 MB HD	$629
Global Village PP Mercury	$326
Global Village PP Gold	$259

Monitors

Apple 14" Plus	$289
Apple 14" AV	$549
Apple 15" M-Scan	$459
Apple 17" M-Scan	$919
Apple 20" M-Scan	$1895
Apple 21" Color Ref	$1099
SONY 14-CPD 1425	$379
SONY 175F1	$869
SONY 15-SE1 COL	$469
SONY 20 SE1/T	$1879
SUPERMAC 21TXL	$2139
SUPERMAC 17T Pro	$829
NEC Xp17 17" Color	$1229
NEC XE21 21" Color	$1989
NEC XP21 21" Color	$2435
Radius Intell/Color 20e	$1819

HOT

U-Max COLOR SCANNER & Dr

UMAX Vista T16 w/PHOTOSHOP LE	$595

Custom Configuration Available

U-MAX UC840W/PHOTOSHOP	$899
U-MAX PowerLook Color	$2859
U-Max 1260 PRO	$1129
Syquest 88c Ext Dr	$389
Micronet 200 MB Ext	$529

with Free! 7Day/24 Hour Support

Printers

Personal LaserWriter 300	$598
Personal LaserWriter 320	$898
LaserWriter Select 360 (10 PPM)	$1298
LaserWriter 16/600 PS	$2098
Color StyleWriter 2400	$439
StyleWriter 1200	$298
Color StyleWriter Pro	$619
HP DeskWriter 540	$298
HP DeskWriter 560c	$499
HP Color Laser	$5985
HP LaserJet 4 M Plus	$1889
HP laserjet 4 MV	$2695

Buy it Today Get it Tomorrow VIA FedEx Federal Express

MasterCard VISA American Express

Mon-Fri 8:00 To 6:00 *Since* 1988
SAT 10:00 TO 2:00 PST
1941 Freeman #B
Signal Hills, CA 90804
Fax (310) 498-0032
In So. California (310)498-1230

PRICES REFLECT CASH DISCOUNT & SUBJECT TO CHANGE W/O NOTICE

MacBase™ U.S.A
Formerly known as MacExpress U.S.A

(800) 951-1230

CIRCLE 443 ON READER SERVICE CARD

$$$

MacAttack

(800) 299-MACS (800) 299-6227
409.690.5353 (Fax) 409.690.5345 (Intl. Sales)
Contact Us Via Internet! MASales@aol.com

We Attack High Prices!!

We carry hundreds of items — call for availability. Your satisfaction is our goal.
One Year Warranty on Apple Products. Prices are COD and subject to change—please call for latest pricing.
International Orders and Fax Orders Welcome!

PowerMacs

6100/66 8/350	$1651
6100/66 8/350 CD	$1841
6100/66 16/500 DOS Card	$2504
7100/80 8/500	$2631
7100/80 8/700 CD	$2939
7100/80 16/700 CD AV	$3475
8100/100 8/700	$3292
8100/100 16/1G CD	$4058
8100/100 16/1GB CD AV	$4254
8100/110 16/2000	$5677

Powerbooks

Duo Dock II	$836
150 4/120	$1360
Duo 280c 4/320	$3243
Duo 280c 12/320 Modem	$3708
520 4/160	$1745
520c 4/160	$2078
520c 12/320 Modem	$2967
540c 4/320	$3563
540c 12/500 Modem	$CALL

Scanners

HP Scanjet 3P	$CALL
Apple One Scanner	$623
Apple Color One Scanner	$862
AGFA Studio Scan II	$855
Other AGFA Scanners	$CALL

Software

Quicken 5.0	$39
MYST CD-ROM	$47
Microsoft Encarta 1995 (CD-ROM)	$88
Norton Utilities 3.1	$94
Canvas 3.5	$259
SoftWindows	$289
Excel 5.0	$299
FileMaker Pro 2.1	$CALL
MS Office 4.2 (CD-ROM or Disk)	$CALL
Aldus PageMaker (68K)	$CALL
Aldus PageMaker (PowerMac)	$CALL
Adobe Photoshop 3.0	$588

And Much More!!

Quadras

Quadra 630 4/250	$880
Quadra 950 8/0	$2713

We sell only Apple original equipment.

Printers

StyleWriter II	$200
Color StyleWriter 2400	$415
Apple Color StyleWriter Pro	$571
LW Select 320, 360	$CALL
16/600PS w/Fonts	$2762
HP LaserJet 4Si	$3196
HP LaserJet 4Si MX	$4678

Monitors

Apple Color Plus 14"	$288
AudioVision 14"	$560
Apple Multiscan 15" Display	$462
Apple Multiscan Trinitron 17"	$952
Apple Multiscan 15"	$469
Sony 17" CPD-175F1 **NEW!**	$869
Sony 17" CPD-1730	$978
Sony Multiscan 17	$1021
Sony Multiscan 20"	$CALL
Apple Multiscan 20 Display	$1913
RasterOps	$CALL
SuperMacs Monitors	$CALL
Supermatch 17 T Professional	$850
E Machines T 16	$999
NEC SFG	$1246
NEC 6FGP	$2330

Great Prices!

Modems

GV TelePort Gold II	$133
GV PowerPort Gold	$281
GV PowerPort 500 Series	$326
GV PowerPort Platinum Teleport	$CALL
GV PowerPort Mercury Fax Duo	$341
Geoport Telecom Adapter	$113
SupraFax 14.4k LC	$134
SupraFax v32bis	$196
SupraFax 28.8k	$249

(Includes Cables & Software)

CDs

Apple CD 300 Plus External	$304
Apple CD 300i Plus	$286
Apple CD Multimedia Kit	$CALL

(Includes Apple Design Power Speakers II & CD 300 Plus External)

Keyboards

Apple Design Keyboards	$75
Apple Extended Keyboard II	$161

Other Stuff

APC Surge Protectors	$24

(Power & Phone Line Protection)

Iomega Cartridges 44/88 MB	$62/62
Kensington Turbo Mouse	$109
Apple Quick Take 100	$687
Quadra 630 Multimedia Acces.	$CALL
PLI (Syquest) 44, 88, 200, 270	$CALL

FREE
Mousepad With Every Order !!

We ship Federal Express. International shipments handled by DHL.
COD: Mastercard, and VISA accepted.
Hours: M-F, 8-7 CST.
15% Restocking Fee for Returned Merchandise.

Call Today About Other Great Product Offers!!

CIRCLE 438 ON READER SERVICE CARD

MacUSA
Since 1983

800-809-0880

Voice: 818-704-8923
Fax: 818-704-9858

Quadra

630/950.....Call

Power Mac

6100-60/66.....Call
7100-66/80.....Call
7100AV/8100AV...Call
8100-80/100/110...Call

PowerBook

150/520.....Call
520C/540C.....Call

Performa Bundle

6115/630.....Call
575/475/638.....Call

Printers

H.P/Apple/Epson/NEC/Okidata.....Call

Monitors

Apple/NEC/Sony/Radius/Viewsonic.....Call

Software

WITH ANY PURCHASE, YOU CAN BUY MICROSOFT OFFICE OR ADOBE PHOTOSHOP FOR $250
ASK ABOUT OUR RED TAG DEMO SPECIALS
WE ALSO SELL:
COMPAQ, IBM, TOSHIBA

PRICES REFLECT CASH DISCOUNT AND ARE SUBJECT TO CHANGE.

We'll Beat Any Price!

Visa, AmEx, & MasterCard Welcome.
24422 Vanowen Street, Canoga Park
California 91307, U.S.A.

CIRCLE 448 ON READER SERVICE CARD

1-800-334-KIWI

Used Macs

Quadra 660AV 8/230 CD	$1549
Quadra 840AV 8/230 CD	$2599
Quadra 650 and Centris 650	Call
PowerMac 6100 & 7100	Call
Powerbook 180c 4/160	$1899
Powerbook 145, 150, 160, 165, 180	Call
Powerbook 520, 520c, 540c	Call

Factory Refurbished Macs

Performa systems include keyboard, 14" color monitor & ClarisWorks.

Performa 400 4/80, 16 mhz 68030	$649
Performa 460 4/80, 33 mhz 68030	$749
Performa 475 4/160, 25 mhz 68040	$899
Performa 600 5/160 CD, 33 mhz 68030	$999
Perfroma 630 8/250 CD, 33mhz 68040	$1299
Performa 6112 and 6115	Call
Stylewriter II with cable	$185
Personal Laserwriter 300 w/toner	$425

Used and refurbished products have a 90 day warranty.

We Buy Used Macs

Quadra, PowerMac & Powerbook only.

Visa & Mastercard No Surcharge.
Better Business Bureau Member.
Over 6 years in Macworld.

Kiwi Computers, PO Box 67381, L.A., CA 90067
Toll Free (800) 334-5494 Fax (310) 286-9667
In California and Overseas (310) 553-4507
Hours: Mon-Fri 8am-5pm, Sat 9am-2pm PST

Returns are subject to a 15% restocking fee.
Prices subject to change without notice. Quantities may be limited.
Not affiliated with Kiwi Software, Inc.

CIRCLE 404 ON READER SERVICE CARD

DATA
MICRO COMPUTER

Dealers & International Sales Welcome!

800-345-1234
TEL: (310) 398-3300
FAX: (310) 391-2488

3847 Grand View Blvd. Los Angeles, CA 90066

-Dealers & consultants call for best current prices!
-We will meet or beat your best prices!
- Next & same day shipping available!
-Visa & Mastercard accepted.
-All prices are 5%+cost "Verified!
-No sales tax for outside of California orders.
"Prices subject to change without notice!"

PowerMac

6100/66

8/350	1377
8/350CD	1777
16/500Dos	2497
16/700 CD	2295
16/1gig/CD	2495

7100/80

8/500	2495
8/700CD	2797
32/700CD	3597
32/2Gig CD	4277
AV16/500CD	3297

8100/100

8/700	3279
16/1Gig/CD	3995
40/2Gig/CD	5247
72/4Gig/CD	7199
AV16/1Gig/CD	4275
AV40/2Gig/CD	5675
110/16/2GgCD	CALL

QUADRA'S

605 4/160	795
605 8/160	945

In Stock!

610 8/160Dos	1240
950 8/230	2895
950 72/1Gig/CD	5475
950 136/4Gig/CD	7850

Specials

HP Laserjet 4M Laser
* 600 dpi
* 8 PPM
$ 1297.
*PostScript printer

Select 310	595
Quantum 230lnt.	149
Quantum 230Ext.	199
External HD case	39
Gcc Portab. printer	179

RasterOps

21" Grayscale	545
20"T Trint. Color	1595

PowerBook's

150 4/120	1075
520 4/160	1660
520c 4/160	1869
540c 4/320	2850
540c 12/320M	3495
540c 12/500M	3796
DuoDock II	CALL

EPSON

ES-800C Pro	CALL
ES-1200c Pro	CALL

GCC

Large format Printers
11x 17 full bleed
Elite-XL 608/600dpi
$ 2599.
Elite-XL 808/800dpi
$ 3470.
Writemove II
$ 199.

PRINTERS

Style Writer II	200
Style Writer color	495
Portable StyL	CALL
Pro 630	1745
Pro 810	CALL
Laser LS	388
Select 310	595
Select 360	1195
DeskWriter 560c	489
D.Writer 1200c	CALL
HP Laser 4M	1297
HP 4M Plus	1945

AGFA

Sudio Scan II	985
Arcus Plus II	2585
Agfa Horizon	16777

SuperMac 20" Trinitron
$ 1495.
Sony 20.36-S $ 1595.

UMAX

Vista 600dpi	347
Vista 300dpi	830
Vista T630	1095
PowerLook Scan	3145

MICROTEK

ScanMaker II	687
ScanMaker IIHR	987
ScanMaker IIG	377
ScanMaker III	2297
ScanMaker IISP	737

SUPERMAC

12T Trinitron	697
17XL Color	677
20TXL Color	1695
Pressview 21"	3027
Thunder 24GT	1297
Thunder 4gx1152	1877
Thunder 4gx1360	2247
Thunder 4 "x1600	2777
Thunder Hgx cards	CALL
17" MultiScan	$ 585.

RADIUS

Precision 17"	830
Interceptor 24E	1777
Video Vue Studio	3077
Video Vision Pro	CALL
Media 100	CALL

radius Telecast
Please call!

FARGO

Primera Color	797
Primera Pro Color	1377
Pictura 310	3577

Drives

Syquest 88MB	279
Syquest 88/44MB	385
Syquest 200mb	445
Syquest 270mb	495
128MB Optical	747
Seagate B'cud 2.4	1097
Seagate B'cuda 4	1997
Seagate Elite 9	3797

RasterOps

Duo Match 1150	

Multimedia

MoviePack Pro	2077
Movie Flow	737
Strata Studio Pro	777
CoSA After Effects	1777
Philips cd-rom rec.	CALL
Animation software	CALL

Scanners

PixelCraft 8000	9877
PixelCraft 4000	2127

Software

Adobe Photoshop
3.0.1 for PowerMac
$ 497.
QMS, Xante, NEC, LaserMaster, Kodak, Seiko, HP, GCC call

CIRCLE 464 ON READER SERVICE CARD

PowerMacs

8100/110 72/2GB CD	$6600
8100/110 8MB No HD	$4700
8100/100 8MB No HD	$2999
8100/100 16/1GB CD	$3950
8100/100 AV 16/1GB CD	$4199
8100/100 AV 72/2GB CD	$5599
8100/80 16/1GB CD	$3799
7100-80 16/1GB CD	$3399
7100-80 AV 16/1GB CD	$3699
7100-66 8/500	$1699
7100-66 AV 8/500	$1899
6100-66 8-350/16-1GB	$1579/2199
5200-75 8-500 CD	CALL

Please Fax Us Your Custom Configuration For Pricing.

radius

Thunder HGX 1360	$1095
HGX 1600/1152	$1499/999
Thunder IVGX 1360	$2199
IVGX 1600/1152	$2599/1899
Thunder 24GT	$1299
Thunder Storm/Pro	$199/299
Thunder II Upgrade	$299
Thunder II Light	$599
Color Card 24 Accelerator	$99
Lemans GT	$799
VideoVision Studio 2.0	$3349
VideoVision Studio	$2599
Spigot Power AV	$729
Spigot II Tape	$299
Spigot & Sound	$199
Video Spigot	$99
Video Spigot Pro F/IISi	$299
Video Spigot LC/Si	$199/99
Display Calibrator Pro	$549
Display Calibrator	$299
Spectrum 24 PDQ+	$399
Spectrum 8.24 PDQ F/IISi	$199
Spectrum 8.24 PDQ	$149
Spectrum Power DSP Upgrade	$199
Spectrum 8 LC	$299
Spectrum 8 Series II	$149
Spectrum 8 F/IISi	$69
Precision Color Pro 24XP	$199
Precision Color Pro 24XK	$299
Precision Color Pro 24X	$499
Futura IILX/IISX	$399/199
Futura Ultra LX/SX	$599/149

SUPERMAC

Radius TPD Interface	$99
Radius Rocket Accelerator	$149
Pivot Color Interface	$199
SuperMac 17T 17" Trinitron	$699
17T/17" Reconditioned	$525/399
PresView 21T/17T	$2999/1799
SuperMac 20" Clr +	$999
20" Hi-Res. Trinitron	$1399
E-Machine E-20	$999
IntelliColor 20i/20e	$1399/1849
Radius Precision Color Pivot	$349
Radius Mono Full Page	$199
Radius Mono/GS. 19"	$499
Radius Mono/GS. 21"	$599
Radius Precision Color 21"	$1399
SuperMac 21" Color	$1299

PowerBooks

540C 4-320/810	$2690/3090
540C 12-320 w/Modem	$3445
540C 12-500 w/Modem	$3690
520C 4-160/320	$1889/2095
520C 12-320 w/Modem	$2795
520 4-160/320	$1575/1750
520 8-540	$1990
150 4-120/320	$1099/1299
4/8/12/16/20MB Memory	Best Price.
Duo 280/280C/270C/250	CALL
160/320 2.5" HD F/PB.	$120/220
540/810 2.5" HD F/PB.	$385/545
14.4 Fax/Modem F/100 Series	$99

Call For All New DUO Models!

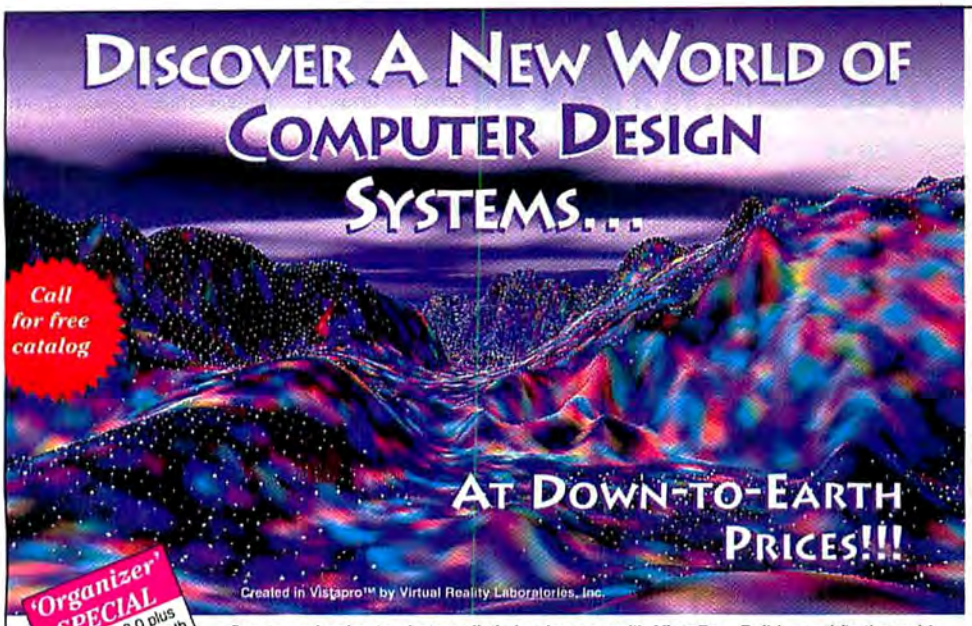
Sales (818) 787-3282 Dealer Hotline (818) 780-9457
All Prices Are Based on C.O.D. Order & Subject To Change! AmEx/MC/VISA Accepted

Universal Computers Inc.
1-800- 929-9333

Export (818) 787-0816 Fax (818) 787-5555
Best Price Guaranteed!

CIRCLE 434 ON READER SERVICE CARD

DISCOVER A NEW WORLD OF COMPUTER DESIGN SYSTEMS...



'Organizer' SPECIAL
In Control 3.0 plus Quicken 5 - get both for just $49

*Create and animate photorealistic landscapes with **VistaPro**. Build – and fly through! – naturally rendered scenes or create a fantasy world. Just $69.99 from CDG Systems.*

When you purchase products for digital design, prepress and video, why not talk to the design system experts?

With **over 22,000** Mac and PC hardware and software items, and warehouses coast-to-coast to serve you, Computer Design & Graphic Systems is your discount source for all of your computer graphics needs.

What in the world are you waiting for? Call one of the friendly graphics specialists at CDG Systems today!

From CPUs to software, from scanners to storage, we will work with you to assemble your ideal system or individual product needs.

UPS · VISA · FedEx · DHL · Authorized Distributor IBM

800-741-6227

Consultants and resellers call Ken at ext. 225

Computer Design & Graphic Systems

6225 Presidential Court Suite F
Ft. Myers, Florida 33919
Local: 813-489-4338 FAX: 813-489-4694

CIRCLE 416 ON READER SERVICE CARD

Big Mac Computers, Inc. Division of WCN

Any Custom Config. Available

Call for New Generation of POWERMAC's

POWER MAC'S

	8/0	8/700	16/1GB	24/1GB	40/2.0GB	72/2.4GB	136/4.0
6100/60	1195	1395	1995	2295	3145	4095	N/A
6100/60AV	1645	1865	2465	2765	3645	4545	N/A
6100/66	1376	1599	2199	2499	3376	4276	N/A
7100/66	1700	1930	2530	2830	3700	4600	7400
7100/66AV	2150	2380	2980	3296	4150	5050	7850
7100/80AV	2550	2775	3375	2675	4550	5450	8250
7100/80	2325	2545	3145	3445	4320	5220	8020
8100/80	2395	2595	3195	3495	4395	5495	8095
8100/80AV	2695	2930	3530	3830	4700	5595	8395
8100/100	2895	3130	3820	4120	4899	5300	8595
8100/100AV	3095	3320	3920	4220	5099	6000	8800
8100/110	4495	4795	5325	5625	6499	7395	10195

APPLE CD 300I PLUS ADD $300. • SOFTWINDOW ADD $150. • 1MB V-RAM ADD $75.

Quadra's

650	8/230	2295
840AV	8/230	CALL
605	4/80	695
630	8/230	975
950	8/500	3095
LC 475	4/160	599

Power Books

540C	4/320	2850
540C	12/320M	3495
540C	36/500M	4895
540	4/240M	CALL
520C	4/160	1935
520	4/320	1850
180 Ref.*	4/120	1800
280C	12/320M	3850
150	8/120M	1650
150	4/120	1030

Work Group Server

95	16/500DAT	2895
80	16/1GBDAT	3295
6150	8/500CD	2795
8150	16/1GB/CD	5595
AppleShare 4.0		695
Apple	4GB DAT	995

Apple Monitor

15" Hi-Res.	419
14" Color Plus	320
17" Color	910
14"AV/20"	579/1950

Apple Printer

SyleWriter II	199
16/600	1995
360/810	1150/3895

Scanners

AGFA Studio Scan II	825
AGFA Horizon	16900
AGFA Arcus Plus II	2650
AGFA ProColor Premier	CALL
Umax Color Look	2879
PixleCraft (Xerox) 4000	2150
PixleCraft (Xerox) 8000	9995

Printers & H.P.'s

Laser 4M/4M+	1595/1899
Laser 5ML/4MP	969/1299
Laser 5M/5M+	CALL
Deskwriter 540/320	295/315
Deskwr. 560C/310C	495/335
HP 4MV	2695
ScanJet IICX	850
DeskJet 1200 PS	1895
GCC, Xante & QMS	CALL

SPECIAL..

APPLE CD 300E PLUS
$ 249.00

Audio Video

Thunder/24	599
Thunder IVGX's	CALL
Radius Video Vision Pro	7995
Radius Video Vision 2.0	3195
Phillips CD ROM Rcrdr.	CALL

Demo MAC's

950	0/0	2195
840/800	8/230	2395
LCII	4/80	395
Quadra 800	4/230	1895
Super Floppy		185

Exchange any old MAC to NEW POWER MAC

10837 SANTA MONICA BLVD. LOS ANGELES, CA 90025
Tel: (310)470-7099 • Fax: (310)470-8099

Toll FREE: (800) 761-1999

Adult CD's Call for FAX list

Call for APPLE 3rd party products • International Orders, Visa, MC & AmEx Welcome • Next Day Shipping for U.S.A. & International Prices are subject to change w/o notice & Limited Quantity • All prices shown are C.O.D. Prices

CIRCLE 453 ON READER SERVICE CARD

IMAGE MACHINES 1-800-909-7879
1-413-436-7879
Computers Apple radius DAYSTAR
Monitors Mitsubishi NANAO NOKIA radius SONY
Printers Apple HP FARGO LEXMARK XANTÉ SONY
VIDEO EDITING ANIMATION CD MASTERING
Radius Telecast FAST TARGA 2000 OPTIBASE
MEDIA 100 3-D DVE Alladin MEDIAMOGUL
ElectricImage • ELECTROGIG • CoSA • form•Z • VIDI
LIVE PICTURE • SHADE • STRATA • Macromedia
AGFA SONY Cameras/VTRs NO CALIFORNIA SALES TAX

ADVANCED MAC SYSTEMS
TEL: (310) 314-7372
FAX: (310) 314-7512
No Tax Outside CA.
Prices are subject to change without notice
Scanners
AGFA Arcus II 2469
AGFA Horizon + ... 15679
Spectrum Scan III+ 1979
Performa
638CD 8/350/TV 1969
6115CD 8/350 2269
Power Macs
6100/66 16/500-CD 2239
6100/66 AV 16/500-CD 2669
7100/80 24/500/CD 3399
7100/80 AV 16/700-CD 3389
8100/100 AV 16/700-CD ... 4249
8100/100 40/700-CD 4959
8100/100 24/700 3899
8100/110 16/2gb-CD 5759
Powerbooks
520 8/240MB 1939
540C 12/500/Modem ... 3879
150 4/120MB 1269
Hard Drive / Optical
120mb .... 125 1GB ext ... 1050
160mb .... 135 1.3GB ext. 1895
230mb 155 5GB 2995
250mb 175 26GB 8229
500mb .... 279 Call for items not listed. (PCI)!
Printers
LaserWriter Select 360 1249
Laserwriter 16/600 PS 2179
StyleWriter Color 2400 449
Epson Stylus Color..... 479
StyleWriter II w/Cable 279
HP Deskwriter 540 279
HP LaserJet 4MV 2749
Monitors
SupeMatch 20TXL..... 2099
ViewSonic 20 Mult 1529
ViewSonic 21 Mult 1799
ViewSonic 17G 789
NEC Multisync XV15 449
Sony Multi-scan 15"..... 449
Apple 15" Multi-Scan 459
Apple 16" RGB 799
Apple 17" RGB 859
CIRCLE 470 ON READER SERVICE CARD

FAST CASH
For All Macs & Peripherals
TOP DOLLAR PAID
CIT Mac Traders
(800)990-0995
(310) 576-2466 Mon.-Fri. 9 AM-6 PM
Sat.10 AM-4 PM (P.S.T.)
CIRCLE 445 ON READER SERVICE CARD

UNBELIEVABLE LOW PRICES
HARD DRIVES(1 YR WRNTY)
CAPACITY INTERNAL EXTERNAL
20MB $40 $80
40MB $58 $98
80MB $85 $135
170MB $125 $165
270MB $159 $199
540MB $225 $265
1080MB $500 $540
FLOPPY DRIVES (90 DAYS WRNTY)
800K--$80 1.44MB--$150
MEMORY
30 PIN 72 PIN
1MB 1X8-80NS $34 4MB 1X32 $134
2MB 2X8-80NS $74 8MB 2X32 $275
4MB 4X8-80NS $129 OTHERS CALL
KAHLON, INC. 1-800-938-5060
22800 OLD CANAL RD PH: 714-637-5060
YORBA LINDA CA 92687 FAX:714-637-5567
CORP., SCHOOL & GOVT. P.O. WELCOME
VISA OVER 5 YEARS IN BUSINESS
CIRCLE 444 ON READER SERVICE CARD

W E BEAT ANY PRICE!
MAC TALK
POWER PC
Quadras & Powerbooks
DISPLAYS, SCANNERS
PRINTERS, MODEMS
DEALERS AND INTERNATIONAL SALES OK
800-622-5557
(818)225-9327
FAX
(818)225-8627
22543 Ventura Blvd., Suite 226
Woodland Hills, CA 91364
CIRCLE 540 ON READER SERVICE CARD

MAC DISCOUNT CENTER
•BUY•SELL•TRADE•NEW•USED•
Performa 410 Complete $699
Performa 466 Complete $859
Performa 475 Complete $899
Performa 630 CD Complete .$1299
Mac LC 520 CD $939
Mac LC 550 .....$885
Mac Quadra 950 8/0 .....$2095
Powerbooks & Power Macs ..Lowest
Quadras & Centris .....In stock
All other Macs & peripherals ....Call
MP-Computers
800-445-6767 Orders only
415.988.0661 Info & International
415.968.0509 Fax

SOMETHING FOR NOTHING
Free Catalog Of Used Macintosh Computers and Peripherals. We've Provided 5 Different Ways For You To Reach Us.
CALL US.
MAIL US.
FAX US OR E-MAIL US.
Or Please Visit Our Web Site At
http://www.sunrem.com/
1-800-SUN-0999
24-hour Order Line (1-800-786-0999)
E-Mail us at: sales@doc.sunrem.com
PO Box 4059
Logan, UT 84323-4059
International (801) 755-3393
Fax: (801) 755-3311
Sun Remarketing, Inc.
CIRCLE 424 ON READER SERVICE CARD

Macworld delivers the products Active Buyers are looking for.
Macworld Shopper Delivers

CUTTING EDGE
ALL DRIVES 5-YR WITH POWERMERGE • LITE FREE!
Hard Drives In Our DIPLOMAT Case
Diplomat 80 Quantum 20ms $99
Diplomat 170 Quantum 16ms $159
Diplomat 240 Quantum 16ms $189
Diplomat 350 Quantum 12ms $209
Diplomat 540 Quantum 12ms $239!
Diplomat 730 Quantum 11ms $299
Diplomat 1080 Conner 9ms NEW! $559!
Diplomat 2105 Conner 9ms $979!
SyQuest Externals Include Cartridges
Diplomat SQ270 3.5" $489!
Hard Drives In Our ZFP Case
Ambassador DEC540 9MS $269!
Ambassador Maxtor 213 15MS $149
Ambassador Quantum210 8MS 7200! $468!
Ambassador Seagate2430 9 GIG 9ms $929
Ambassador Conner4207 4 GIG 7200! $1549
CD-ROM's External w/RCA Jacks
Ambassador NEC 2x speed $179!
Ambassador Plextor 6x speed 145ms $569!
Quantum GROS80s great value 17ms $95!
Quantum 520mb low power 15ms $409!
SUBJECT TO CHANGE CALL FOR LATEST PRICES
INTERNATIONAL SALES 619-441-6962 FAX 619-411-6999
WE MANUFACTURE & DESIGN OUR CASES IN U.S.
POWER IN THE PALM OF YOUR HAND THE DIPLOMAT $45!
THE SIZE OF A VCR TAPE
540MB EXT $239!
• POWER MAC •
PPO 6171 to 84mhz accelerator clip $99!
PPO 8100 to 110mhz accelerator clip $99!
• PERIPHERALS •
Keyboard ext105 $79
Blank keyboard $59
CASES •
Diplomat • • • $45
size of VCR tape
Ambassador • $45
ZFP SCSI case
Courier • • • • $69
2.5" case & kit
Attache • • • • $55
CDROMw/ RCA jacks
Full height • • $119
1-800-257-1666
Internet at "CUT EDGE@eworld.com"
CIRCLE 449 ON READER SERVICE CARD

MacBYTE
SERVING MACUSERS SINCE 1989
LOW & HIGH END CUSTOM SETUPS
CASH FOR MACS
FAX 310-317-1583
BUY • SELL • TRADE
800-432-2983
Open Monday-Saturday
22775 PCH, Malibu, CA 90265
CIRCLE 428 ON READER SERVICE CARD

WHAT ARE YOU LOOKING AT?
ONLY THE BEST MONITOR PRICES IN THE NATION
MITSUBISHI
DIAMOND PRO 21T
21" MULTI-SCAN
RESOLUTIONS TO
1600 x 1200 NI
ONLY $1,795
CAPETRONICS
CDS-423W
MULTI-MODE 17"
RESOLUTIONS TO
1152 x 870
ONLY $599
MITSUBISHI
FG6601
FIXED-RES 16"
RESOLUTION OF
832 x 624
ONLY $345
Call Today
The VIDEO WORKS
25-N Beta Ct., San Ramon, CA 94583
800-838-1031
CIRCLE 403 ON READER SERVICE CARD

We Carry New Products Only!

Ask for free CD Title with complete system

TO ORDER CALL 800•223•4622

Apple External CD ROM
(DoubleSpeed) .. $219↔H42488
While supplies last

LOW RATE BUSINESS LEASING IS AVAILABLE

Apple Brand 160MB PowerBook Drive
$169↔H78077

PowerMac 8100, 110MHz , PowerPC 601 RISC Processor

136MB Memory/4GB Seagate Barracuda SCSI II Dr./Apple CD Plus ..... 9869↔C69882
72MB/2GB/Apple CD Plus/4MB Vram/Supermac 21TXL Monitor ..... 9469↔C61657
(AV)/40MB Memory/2GB HD/Apple CD Plus ..... 6799↔C34136

PowerMac 8100, 100MHz , PowerPC 601 RISC Processor

40/4GB Seagate Barracuda SCSI II Dr/4mb vram/20" monitor/Keyboard .. 7369↔C79180

AV/40MB/1GB/CD	4785↔C30405	AV/24/1GB/CD	4444↔C31627
24/700MB/CD	4129↔C16631	136/4GB/CD	8299↔C03931
40/2GB/CD	5219↔C96773	264/4GB/CD	11959↔C74426
72/4GB/CD	6469↔C38935	24/2GB/CD	4849↔C09066

PowerMac 7100, 80MHz , PowerPC 601 RISC Processor

24/2GB/2vram/17" Monitor/AppleCD/Extended keyboard ..... 5119↔C37800

(AV)/16MB/700/CD	3395↔C36247	(AV)/40MB/2GB/CD	4699↔C63835
72/2GB/CD	5429↔C27850	40/2GB/CD	4499↔C71051
24/700MB/CD	3399↔C73958	136/4GB/CD	7595↔C84724
16/700MB/CD	3199↔C20673	8/700MB/CD	2979↔C52492

PowerMac 6100, 66MHz

Package Deal ..... 2895↔C22342
16/350MB/CD/17"ColorMonitor/Keyboard
16MB/350MB/CD ..... 2099↔C78071
16/350/14"Mntr/CD/kybrd. 2379↔C17456
24/730/15"Mntr/CD/kyb.rd 3019↔C96104
24/1GB/15"Mntr/CD/kybrd.3259↔C18327
24/500MB/Dos Card/CD.. 2799↔C70994

Quadra 950

72MB/1GB	HD	$5595↔C30986
24MB/1GB	HD	$3979↔C63798
72MB/2GB	HD	$6125↔C82486

Quadra 630, 33Mhz, 68040

8/500/Sony CD ..... 1499↔C21885
w/free Microsoft

Free Case with Purchase of PowerBook 500 series (Limited Quantities)

PowerBooks 520, 25 MHz, 68LC040

8/160/19.2 Fax•Modem ... 1999↔C97526
12/240/19.2 Fax•Modem . 2377↔C43092
20/320/19.2 Fax•Modem . 2749↔C04098

PowerBooks 520C 25 MHz, 68LC040

8/240/19.2 Fax•Modem ... 2679↔C86273
12/320/19.2 FAxModem .. 2959↔C63003
20/500/19.2 FAxModem .. 3419↔C93017

PowerBooks 150

8/120/19.2 Fax•Modem .. 1469↔C71255
8/240/19.2 Fax•Modem .. 1529↔C64239
14/240/28.8 Fax•/Modem 1789↔C46764

PowerBooks 540C 33 MHz, 68040

8/320/19.2 Fax•Modem .. CALL↔C31204
20/500/19.2 Fax•Modem CALL↔C36692
36/500/19.2 Fax•Modem CALL↔C40402

Apple Printers

Personal 320 ..... 895↔P35275
Select 360 ..... 1299↔P57306
LaserWriter 16/600ps ..... 2298↔P55543
Color Stylewriter 2400 ..... 449↔P53203
Stylewriter 1200 ..... 259↔P16666
Color Stylewriter Pro ..... 595↔P47625

Apple Monitors

14" Color Plus ..... 298↔M88684
Multiple Scan 15" ..... 479↔M03237
Audio Vision 14" ..... 549↔M45430
Adapter/ non PowerMac ..... 38↔M55417
Multiple Scan 17" ..... 944↔M63282
Multiple Scan 20" ..... 1979↔M90816

C17349↔ Workgroup Server 8150
Power PC 601 RISC, 80 MHZ, 5799
16/ 1000 MB HD, CD, DAT, Share 4.0.2

C88298↔ Workgroup Server 9150
Power PC 601 RISC, 80 MHZ, $6799
16/ (2)1GB Array, CD, DAT, Share 4.0.2

UMAX®

Adapter/Feeder ..... 489↔S90183
PowerLock w/transpa ..... 2799↔S36600
PowerLock ..... 2299↔S78406
UC1260/Photoshop ..... 899↔S06216
UC1260/Photoshop LE ..... 799↔S95787
Vista S8/Photoshop ..... 875↔S42579
Vista S8/Phtoshop LE ..... 775↔S90730
Vista T630/Photshp LE/Omni . 529↔S86591
Vista T630/Color It & OCR ..... 469↔S81482
Vista S6/Photoshop ..... 699↔S52667
Vista S6/Photoshop LE ..... 644↔S61583
Gemeni GD16 Pro ..... 1499↔S14972
Gemeni GD16 LE ..... 1399↔S90053

MICROTEK

Better Images Through Innovation.

III/Photoshop	2369↔S89534
TransparencyAdapter	139↔S05224
IISPXPhotoscp	879↔S76036
IISP W/Color It & Omni page .	529↔S49199
II /Photoshop LE	459↔S43716
II HR W/Photoshop	999↔S97548
II HR W/Photoshop LE	819↔S04376
IIG	328↔S46370
Slide Scanner 35T	939↔S28672
Slide Scanner 45T	5299↔S38534
AutomaticDocument Feeder	388↔S01715
TransparencyAdapter, IIXE,IIS, IISPX II, IIHR	509↔S32906

EPSON Scanner, Printer

Epson ES-1200C Pro ..... 1277↔S88449
ES-800C LE ..... 749↔S46891
Stylus Color Printer ..... 529↔P94964

AGFA Scanner

Arcus II ..... 2595↔S05520
Studio Scan II ..... 899↔S47498
Transparancy/Arcus II ..... 369↔S23167

NEC Monitor

14 MultiSync 2V ..... 335↔M23792
15 MultiSync XV15 ..... 469↔M87288
15 MultiSync XP15 ..... 649↔M65680
15 MultiSync XE15 ..... 559↔M43772
17 MultiSync XP17 ..... 1215↔M39560
17 MultiSync XE17 ..... 999↔M12918
21 MultiSync XP21 ..... 2419↔M86537
21 MultiSync XE21 ..... 1979↔M62738

Sony Monitor

15SF ..... 477↔M20795
17SF ..... 855↔M87025

Texas Instrument

MicroLaser PowerPro ..... 1649↔P01221
MicroLaser Pro600 65font ... 1569↔P06486
MicroLaser Pro600 23font ... 1195↔P68335

Softwares

Adobe Illustrator V5.5 ..... 369↔P14367
Adobe PhotoShop 5.5 ..... 558↔P15656
Aldus PageMaker 5.5 P.M. .... 559↔P29068
Aldus FreeHand 5.0. ..... 386↔P82647
Microsoft word 6.0. ..... 291↔P25835
QuarkExpress 3.31 ..... 569↔P96306

Global Village

Mercury 19.2 TelePort ..... 279↔P33300
Mercury 19.2 PowerPort ... 325↔P78077
Gold 14.4 TelePort ..... 225↔P45430
Gold 14.4 PowerPort ..... 235↔P81482
TelePort Gold II ..... 139↔P01715
OneWorld ..... CALL↔P04153

WE HAVE THE BEST PRICE ON MEMORY ANYWHERE

MAC 72 PIN SIMMS

(LCIII, CENTRIS, QUARDA, POWERMAC)

4MB 32bit 72pin 70ns ..... 155↔S91240
4MB 32bit 72pin 60ns ..... 159↔S18312
8MB 32bit 72pin 70ns ..... 279↔S17441
8MB 32bit 72pin 60ns ..... 289↔S01929
16MB 32bit 72pin 70ns ..... 459↔S18163
16MB 32bit 72pin 60ns ..... 469↔S69201
32MB 32bit 72pin 70ns ..... 955↔S31211
32MB 32bit 72pin 60ns ..... 959↔S54228

STANDARD 30 PIN MEMORY

1MB 8bit 30pin 70ns ..... 39↔S24010
4MB 8bit 30pin 70ns ..... 133↔S89303
16MB 8bit 30pin 70ns ..... 533↔S05418
16MB RADIUS ROCKET ..... 559↔S03574

PowerBook 500 Series

4MB RAM Module ..... 169↔S47539
8MB RAM Module ..... 322↔S61337
16MB RAM Module ..... 599↔S60627
32MB RAM Module ..... 1139↔S04142

PowerBook 150

4MB ..... 169↔R65651
6MB ..... 249↔R12143
8MB ..... 319↔R15387

PINNACLE MICRO Opticals

THE OPTICAL STORAGE COMPANY™

Optical Sierra 1.3 (19ms) ..... 2095↔L39296
Optical Tahoe 230 W/Cart) ..... 719↔L37318
Recordable RCD 1000 ... ↔L65724
1 MB cache $1499 Double speed

Legend Syquest Removables

Syquest 88c/Cartridge ..... 349↔R07110
Syquest 200/Cartridge ..... 487↔R13241
Syquest 270/Cartridge ..... 479↔R07785

Digital Video Products

Radius Video Vision ProPak ..... 7999↔D90401
Radius Video Vision Studio 2.0 ..... 3399↔D79017
Radius Studio Vision Studio Array . 4899↔D62077
Radius SpigotPower AV ..... 749↔D97458
Radius Spigot Pro AV ..... 1249↔D14229
Radius Edit ..... call↔D12063
Radius Video Fusion ..... 249↔D12063
Adobe Premiere ..... call↔D32249
Adobe After Effects ..... call↔D90466
After Effects Rendering Engine ..... call↔D33216
FWB SL4100-2W FMF Wide ..... 4149↔D19358
(4GB Wide Disk Array with SCSI JackHammer)
FWB SL8200-2W FMF Wide ..... 5599↔D02591
(8GB Wide Disk Array with SCSI JackHammer)
Pinnacle Sierra 1.3 ..... 2095↔D54263

Nikon ELECTRONIC IMAGING Scanner & Printer

CoolScan External ..... 1277↔S30590
ScanTouch 1200DPI ..... 1199↔S33732
CoolPrint ..... 1459↔P81973

Polaroid Slide Scanner

SprintScan 35 Slide Scanner ..... 1829↔97760

Iomega Removable Drive

Zip 100MB Removable Drive ..... 193↔R35848
100MB Carteidge ..... 19↔R91983

Portrait Display Lab/Radius

Portrait 15" Pivot Res (832x624) ..... 566↔R00199

FARGO Color Printer

PrimeraPro Color (600x300DPI) .... 1399↔R50993

Quantum

Daytona PowerBook Drive (2.5")

Capacity	Access	Internal
256MB	17ms	249↔H19924
341MB	17ms	319↔H28609
514MB	17ms	399↔H96648

Quantum 3 1/2 inch Lighting (Low Profile)

Capacity	Access	External
730MB	11ms	329↔H89428

Quantum 3 1/2 inch Empire (Low Profile)

Capacity	Access	External
1080MB	9.5ms	629↔H38351
2100MB	9.5ms	929↔H54690

Quantum 3 1/2 inch Atlas (Half Height)

Capacity	Access	Internal
2100MB	9.5ms	949↔H41583
4280MB	9.5ms	1499↔H17564

We carry both Internal and External drives
External Drives come withSCSI Cable & Terminator

MICROPOLIS 5 Years Warranty

Micropolis AV Drives

Capacity	Access	Model	External
2.1GB	8.5MS	4221AV	1109↔H27395
4.3GB	8.5MS	3243AV	1629↔H63904

Micropolis Drives

Capacity	Access	Model	External
2 GB	8.5MS	4221	1049↔H41548
4 GB	8.5MS	3243	1559↔H49197
9 GB	12MS	1991	2799↔H82277

Seagate 5 Years Warranty

Capacity	ACCESS	External
2.4GB Barracuda2	8ms ...	1099↔H16275
4.2GB Barracuda4	8ms ...	1499↔H24120
9.0GB Elite 9	11ms .	3099↔H17668

All drives are tested and come with the latest FWB HDT tool kit.. All drives come with full factory warranty.

EXABYTE Tape Drives

8205, 2-5GB, 263kb/s, 8mm ..... 1366↔T03129
8505XL, 7-17GB, 8mm ..... 2125↔T06177
4200CI, 2-4GB, 4mm ..... 1049↔T36478
Retrospect 2.1 ..... 99↔T16268
Exabyte 4mm DAT 90/120 Metes 15/21
Exabyte 8mm DAT 112 Meters 13

ATTO Board

SiliconExpress IV ..... CALL↔U84067

radius Monitors

Precision 17" Flat ..... 979↔M13284
Precision20e ..... 1855↔M16834
2 page 21GS ..... 979↔M74151
Press View 21T ..... 2969↔M92027
SuperMatch 21TXL ..... 1999↔M24670
SuperMatch 17T PRO ..... 819↔M36665
SuperMatch 20Plus ..... 1429↔M10771
Press View 17T ..... Call↔M00770
PhotoEngine ..... 799↔V22878
Precision Color Pro 24XK ..... 999↔V02179
Precision Color 24XP ..... 279↔V51602
Precision Color 24Xk ..... 699↔V07270
Precision Color 24X ..... 899↔V76517
Spectrum power 1152 ..... 899↔V97275
SpectrumSeries V 24 Bit ..... 555↔V45960
Thunder IVGX 1152 ..... 1819↔V21224
Thunder IVGX 1360 ..... 2249↔V00370
Thunder IVGX 1600 ..... 2779↔V30420
Thunder 24 GT ..... 1289↔V03883

ASANTE

10BT Hub/12 10T, Thk, Thin ..... 355↔N57015
10BT Hub/8 10T, Thk, Thin ..... 269↔N57000
Media Adapter ..... 59↔N21532

SONY Tape Drives

SDT 5000M 8GB(Compression) 4mm 999↔S32534
SDT 5200M 4GB 4mm ..... 949↔S67006
Retrospect 2.1 ..... 99↔T16268
Sony 4mm 90/120 ..... 12/12

HEWLETT® PACKARD Printers

Call For HP 5 series

4ML 300X300,4PPM, 4MB RAM ... 999↔P62247
4MPlus 600DPI, 12PPM, 6MB .... 1949↔P61657
4MP 600X600,4PPM, 6MB ..... 1358↔P93017
4MV 600DPI,11X17 TRAY,12MB 2699↔P63282
320 600X300 3PPM ..... 299↔P51583
540 600X300 3PPM ..... 299↔P87228
560C 600X300, 3PPM ..... 489↔P99052
1200CPS 600X300, 4MB ..... 1579↔P47887

WACOM Tablets

ARTZ 6x8 ADB Tablet ..... 289↔T99016
ARTZ 6x8 ADB/Fractall Painter 3.0 539↔T81085
Art Pad 4X5 w/Fractal Painter 3.0 . 399↔T64933
Art Pad 4X5 w/Fractal Dabbler ..... 189↔T66279
UD 12X12 STANDARD ..... 479↔T80432
UD 12X12 w/Fractal Painter 3.0 .... 769↔T65793
UD 12X18 STANDARD ..... 649↔T83287
UD 12X18 w/Fractal Painter 3.0 ... 755↔T34142

- All Returns are subject to restocking fee, must be in original package, condition & needs an RMA#
- All Prices reflect a Cash Discount. Any other method is 2% higher
- Prices are subject to change without notice

Address: 6924 CANBY AVE UNIT#104
RESEDA CA. 91335

International Call: 818•708•6388
Customer Service and Technical support Call: 818•708•6388
Fax: 818•708•6399

To Order Call 1•800•223•4622

CIRCLE 420 ON READER SERVICE CARD

POWERMAC

6100/60	8/250	$1399
6100/60	8/250/CD	$1649
6100/60AV	8/250/CD	$1999
6100/66	8/350	$1599
6100/66	8/350/CD	$1799
6100/66	16/500/DOS/CD	$2499
7100/66	8/NO HD	$1749
7100/66	16/500/CD	$2549
7100/66	40/1GIG/CD	$3449
7100/66AV	16/500/CD	$2799
7100/80	8/500	$2499
7100/80	8/700/CD	$2799
7100/80AV	16/700/CD	$3299
8100/80	8/0	$2699
8100/80	8/500	$2899
8100/80	16/500/CD	$3399
8100/80	16/1GIG/CD	$3549
8100/80	40/1GIG/CD	$4199
8100/80	72/2GIG/CD	$5699
8100/80	136/2GIG/CD	$7299
8100/80AV	16/500/CD	$3599
8100/80AV	72/2GIG/CD	$6299
8100/80AV	136/2GIG/CD	$7899
8100/100	8/0	$2999
8100/100	8/700	$3199
8100/100	16/1GIG/CD	$3999
8100/100AV	16/1GIG/CD	$4199
8100/100	40/1GIG/CD	$5099
8100/100	72/2GIG/CD	$5999
8100/100	136/2GIG/CD	$7699
8100/100AV	136/2GIG/CD	$8199
8100/110	16/2GIG/CD	$5499

WorkGroup Server

6150	8/500/CD/AplShr	$2999
8150	16/1GIG/CD/AplShr	$6099
9150	16/2GIG/CD/AplShr	$7699

SCANNERS

MICROTEK	IIHR	$967
MICROTEK	IISP	$737
UMAX	1260PRO	$1099
UMAX	UC840 W/PHOTO	$869
UMAX	UX630LE W/PHOTO	$575
UMAX	POWERLOOK COLOR	$2849
HP	SCANJET IICX	$929
EPSON	1200C	$1279

Apple Monitors

14" Color Plus	$299
14" RGB HIRES	$379
15" MultiScan	$499
17" MultiScan	$979
20" MultiScan	$1949
AudioVision 14" w/adt	$629

NEC Monitors

XP15	15" Color	$599
XE17	17" Color	$949
XP17	17" 1280X1024	$1249
XP21	21" 1600X1200	$2449

CD-ROM

SONY	CDS-760 INT	$279
SONY	CDS-7611M EXT	$309
NEC	QUADSPEED 4XE	$399
APPLE	300I PLUS INT	$269

PLI

200MB 5.25 EXTERNAL	$579
88/44RW 5.25 EXTERNAL	$429
270MB 3.5 EXTERNAL	$499
105MB 3.5 EXTERNAL	$359
1 GIG Quick Array F-REM	$1599
4 GIG Quick Array F-REM	$4299
1.3 GIG Magneto Optical	$2399

WACOM

12x12	STYLUS AND TABLET	$449

UNIVERSITY, GOVERMENT, AND FORTUNE 1000 P.O.'S, Trained Staff.

LA's LEADING COMPUTER STORE!

LA COMPUTER CENTER

(800) 689-3933 ORDERS ONLY!

(310) 473-2535 FAX (310) 312-9041

NO CREDIT CARD SURCHARGE!

Prices subject to change without notice. CALL FOR LATEST PRICE

FedEx NEXT DAY AND SAME DAY SHIPPING. CALL FOR DETAILS.

8100 100AV BUNDLE

16/1GIG/CD

SONY 17SF 17" COLOR DISPLAY
APPLE DESIGN KEYBOARD
28.8 MAC&FAX EXTERNAL

SALE $5429!

PERFORMA BLOWOUT!

Performa 6115 8/350/CD FREE Software! Includes 14" Color Monitor Keyboard Included $2199

Performa 630 8/250/CD FREE Software! Includes 14" Color Monitor Keyboard Included $1449

Performa 630 4/250 w/FPU Includes 14" Color Monitor Keyboard Included $1099

Performa 550 5/160/CD 14" Color Monitor, REFURB. 68030 33MHz $799

MAC LC 475

Same as Quadra 605, 68040 at 25MHz!

4/160 $649! Limited Quantity.

SONY MONITORS

1425 14"	$329
15SF 15"	$439
17SF 17"	$869
20SE 20"	$1849

RADIUS / SUPERMAC

VIDEO BOARDS

PRECISION 24XK	$749
PRECISION 24X	$1019
THUNDER 24/GT	$1399
THUNDER IV GX 1152	$1849
THUNDER IV GX 1360	$2209
THUNDER IV GX 1600	$2698

MONITORS

PORTRAIT\ 15 PIVOT	$599
SUPERMATCH 17I	$879
PRECISION COLOR 17	$999
SUPERMATCH 20+	$1499
INTELLICOLOR 20E	$1949
SUPERMATCH 21TXL	$2079

MULTIMEDIA

VIDEO VISION STUDIO 2.0	$3549
VIDEO VISION 2.0 PROPACK	$8429

GE 4 YEAR ON SITE WARRANTY!

To range of Radius Products. Based on the product's value as it is listed below.

$100 to $350	$351 to $750	$751 to $1200	$1201 to $2000	$2001 to $3000	$3001 to $5000
$49.95	$79.95	$139.95	$169.95	$199.95	$259.95

POWERBOOK

150	4/120	$999
165'S & 180'S		CALL
520	4/160	$1499
520	4/240	$1649
520C	4/160	$1899
520C	8/240	$2299
520C	12/320/FAX	$2699
540	4/240	CALL
540	12/320/EXP	CALL
540C	4/320	$2799
540C	12/320/FAX	$3499
540C	12/500/FAX	$3699
540C	20/500/FAX	$3999
540C	36/500/FAX	$4699

DUO

250	4/200	$1599
250	12/200/EXPRESS	$2249
270C	4/240	$1995
270C	12/240/FAX	$2599
280	4/240	$2389
280C	4/320	$2999
280C	12/320/Modem	$3659
Mini Dock		$299
Duo Dock	230HD	$649
Duo Dock II		$899
External 1.44 Floppy		$149
210 & 230's		CALL

CALL FOR NEW MODELS!

QUADRA

605	4/160	$749
610	8/230	$1249
610	8/230/CD	$1449
610	8/230/DOS	$1399
630	4/240	$949
630	8/240/CD	$1499
650	8/230	$2199
800	8/230	CALL
840AV	8/500	CALL
950	8/0	$2849
950	8/500	$3099
950	16/1GIG/CD	$3999

Apple Printers

Select 300 w/Toner	CALL
LASER 320 w/Toner	$899
Select 360 w/Toner	$1199
Pro 630 w/Toner	$1799
LaserWriter 16/600	$1999
Pro 810 w/Toner duplex	$2999
Portable StyleWriter	$349
StyleWriter II Refurb	$159
Color StyleWriter PRO	$599
Color StyleWriter 2400	$449

Hewlett Packard

DeskWriter 540	$299
DeskWriter 560c	$479
DeskWriter 320	$299
DeskWriter 320/SHEET	$369
DeskJet 1200c (PS)	$1649
LaserJet 4ML	$989
LaserJet 4MP	$1199
LaserJet 4M	$1299
LaserJet 4M Plus	$1849
LaserJet 4MV 11x17	$2799
500 SheetFeeder	CALL
PowerEnvelope Feed	$279

INTERNAL HARD DRIVES

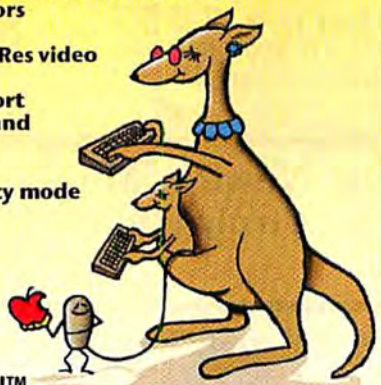
External Case/Cable		$79
Quantum	160MB/250MB	$129
Quantum	250MB/500MB	$179/$249
Apple	700MB	$299
Quantum	1GIG/2GIG	$569/$1099
Seagate 1GIG		$549
Barracuda 2.4 GIG		$1199
FWB Hammerhead		CALL
Micropolis 9GIG 8ms		$3499

We carry only new products. Let us custom configure your system! We accept VISA, MasterCard, and AMEX.

CIRCLE 497 ON READER SERVICE CARD

Add a second keyboard, monitor and mouse up to 250 feet away from your Macintosh!

- Compatible with most Macintosh computers with detachable monitors
- Supports Macintosh Hi-Res video
- Macintosh mouse support standard at both local and remote workstations
- Switch selectable privacy mode
- No software required for operation



MAC COMPANION™

Cybex Corporation
4912 Research Drive Huntsville Al 35805 USA
(205) 430-4000 (205) 430-4030 fax

CYBEX™

Macintosh and Mac are trademarks of Apple Computer, Inc. Cybex and Companion are trademarks of Cybex Corporation.

Dealer Program Available **Made in USA**

CIRCLE 433 ON READER SERVICE CARD

Powermacs		Apple Monitors		Hewlett Packard		Agfa	
6100 16/500/cd/dos	2475	14" Color Plus	289	Deskwriter 320	295	Studioscan 600dpi	659
6100 /66AV 8/350/cd	2275	15" Multiscan	Call	Deskwriter 540	299	Studioscan II 800	845
6100/66 16/350/cd	2099	14" AV Trinitron	589	Deskwriter 660C	489	Transparency	375
7100/80 8/500	2499	17" Multiscan	Call	Laserjet 5MP(new)	1299	**N.E.C.**	
7100/80 8/700/cd	2799	20" Multiscan	1895	Laserjet 4M Plus	1869	CD 4XI	475
7100/80 av 16/700/cd	3299	**Radius**		Deskjet 1200C p/s	1595	CD 3XP	389
8100/100 8/700	3195	Pivot color 15"	799	Laserjet 4MV	2699	XV14/XV 15	345/459
8100/100 16/1G/cd	Call	Precesion clr. 17"	945	Laserjet 4SiMX	4079	XV 17	775
8100/110 16/2G/cd	Call	Intellicolor 20E	1898	Scanjet 3C(Latest)	919	XE15/XP15	545/669
Quadras/Performas		Vidiovision studio	3495	Scanjet IIP/3P	365/495	XE17/XP17	995/1239
Q630 4/250	969	Videovision Propak	8295	Jet Direct Card	299	XE 21/XP 21	1995/2445
Q630 8/250/cd	1445	Studio Array 4GB	Call	Duplex option 4M+	495	**Sony**	
Q630 20/500/cd	1975	Thunder IV GX	Call	500 sheet mechnism	325	GVM 2020 21"	1495
Performa 575 8/250/cd	1439	Thunder II gx 1600	1599	Call for all Accessories		GDM 20SE1	1799
Performa 630 8/250/cd	1499	**Microtek**		**Miscellaneous**		15SF/17SF	445/859
Performa 6100 8/500/cd	Call	II SPWI SPX	545/645	Wacom ArtZ 6x8	299	**Nikon**	
Newton 120 2MB	685	II HR / III HR	995/Call	Calcomp CCL 600	1999	Coolscan Ext.	1789
Apple Printers		35T Slide	899	PPI 14.4E modem	119	Scantouch 1200 dpi	1099
Stylewriter 1200	285	**Mitsubishi**		6100 DOS CARD	535	Coolprint	1409
Stylewriter 2400 clr	445	Diamond Pro 15fs	445	Powermac AV Card	419		
Stylewriter Pro clr	575	Diamond Pro 17fs	899	Epson Scan 1200C	945		
Portable Stylewriter	389	Diamond Pro 21fx	1825	Epson Stylus color	525		
Laserwriter 300	619	Diamond Pro 21T	1995	APC 450VA UPS	175		
Laserwriter 320	865	**Pinnacle Micro**					
Laserwriter 360	Call	Recordable CD	1695				
Laserwriter 16/600	Call	Tahoe 230 MO	875				
Powerbooks		Sierra 1.3 gb MO	2125				
150 4/120	995	**Micronet**					
150 4/250	Call	200MB Syquest	515				
520 8/160	1759	270MB Syquest	529				
520C 4/160	Call	88/44 RE	439				
520C 12/320/Mdm	2865	2gb ext. DAT	899				
540C 4/320	Call	8gb ext. DAT	1195				
540C 12/500/Mdm	Call	**NewGen**					
Duo Mini Dock	299	Designxpress 6	2995				
Duo Dock 230HD	599	Designxpress 12	5595				
Duo Dock II	855	DE 12 Oversize	6795				
UMax		DE 6 Oversize	3595				
Vista S-6 Pro	875	DE Ethernet card	379				
Vista S-6 LE	765						
UC 1260	1075						
Transparency 1260	445						

Call for items not listed in this Ad.

✻ *Special Package* ✻

6100/66 16/500/cd/dos/15"monitor /KB	2845
6100/66 8/350/14" monitor/KB	1925
8100/100 16/700/cd/15" monitor/KB	3999

Mac Storm International *Since 1988*

Call (310)829-9780
Free fax inquiry **1-800-fax-9553**
Local & Int'l Fax (310)315-1009
International and Dealer sales welcome.
Corp. Leasing available.
Prices reflect cash discount. Credit card prices are higher.
Prices may change w/o notice. **Call for current best prices**

CIRCLE 440 ON READER SERVICE CARD

M.P.D.

1-800-993-5673
Tel (305) 477-4441 Fax 477-4602
15 Days Money Back Guarantee (*)

New! Power Macs	
610/66 8/350	1,621.
610/66 8/350 CD	1,808.
710/80 8/500	2,583.
710/80 8/700 CD	2,896.
710/80AV 16/700 CD	3,412.
8100/100 8/700 - In Stock!	3,232.
8100/100 16/1000 CD - In Stock!	3,984.
8100/100AV 16/1000 CD - In Stock!	4,176.
8100/110 16/2000 CD - In Stock!	5,677.

BONUS! Buy SoftWindows for $149. with the purchase of a PowerMac while supplies last.

Performas Special	
Performa 475 4/250 Bundle w/Color Plus, Design Keybrd & Mdm	999.
Performa 630 4/250 w/FPU Bundle w/ Color Plus, Design Kybrd & Mdm	1,149.
Performa 630 8/250 CD Bundle w/ Color Plus, Design Kybrd & Mdm	1,490.

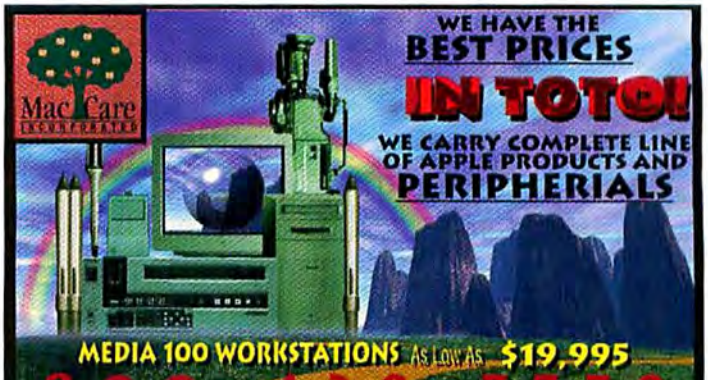
SPECIAL! Pay only $199. for the StyleWriter II with the purchase of any Performa Bundle.

Powerbooks	
Powerbook 150 4/120	972.
Powerbook 520 4/160	1,527.
Powerbook 520C 4/160	2,040.
Powerbook 540 4/240	2,300.
Powerbook 540C 4/320	3,095.
Powerbook 540C 12/500 Mdm	4,095.
Powerbook Duo 280C 4/320	3,284.

Printers / CD's	
Color Stylewriter Pro	561.
Stylewriter II	250.
Color Stylewriter 2400	426.
PersonalLW 320	845.
PersonalLW 360	1,399.
Laserwriter 16/600	1,999.
External CD300e+ BONUS CDs	265.

Monitors	
Apple 14" Color+ Display	269.
Apple 15" Multiple Scan	440.
Apple 17" Multiple Scan	895.
Apple 20" Multiple scan	1,878.
Sony 15" MultiScan	441.
Sony 17" MultiScan 17sf	870.
Sony 20" MultiScan 20se	1,810.

Receive WordPerfect Bundled FREE with any PowerMacintosh while supplies last.
Please call for memory, Hard Drives & Custom Configurations.
Prices reflect cash discount. All prices and availability subject to change. All major credit cards accepted.
Se habla espanol. Int'l orders welcome. FREE 2nd day shipping for orders over $2,500. Please call for details.



DIGITAL VIDEO/PUBLISHING WORKSTATION SPECIALISTS

MACINTOSH SYSTEMS

8100/100MHZ AV 16/700 CD 4,195	Server 9150/ 8150 . .5.650/ 4.550	Quadra 630 8/250 1,245
8100/100 16/2GB/CD 4,850	6100/66 8/350 1,595	PBK 520C 4/160 1,895
8100/100 8/700 3,295	Quadra 950 16/1G 3,555	PBK 520C 12/160 2,250
8100/110 16/2G/CD 5,795	Quadra 650 8/250 1,945	PBK 520C 12/160/Modem . 2,550
7100/80 8/500 2,650	Quadra 630 4/250 1,050	PBK 540C 12/320/Modem . 3,575

DIGITAL VIDEO	VIDEO CARDS SPECIALS	SOFTWARE
Media100 . . . . . .CALL	Thunder IV 1360 2395	Adobe PhotoShop 3.0 PPC . .425
Radius VideoVision Studio .3495	Thunder II GX 1360 950	CoSA After Effects 1,475
RasterOps MoviePackPro .2,875	Thunder II GX 1600 1,250	Strata Studio Pro 795
Radius Telecast . . . . . .CALL	Radius 8XJ 450	Illustrator 325

MEMORY	HARD DRIVES	MONITORS
32 Mb Module 895	Micropolis 3GB Av 1,150	Apple 17" Trinitron 825
16 Mb Module 495	Apple 700MB Internal 250	SuperMac PressView 21T .2,995
8 Mb Module 325	IBM 1Gb 425	NTSC/PAL 20" . . . . . .Call

Prices subject to change without prior notice; reflect a cash price only. • Se Hablamos Espanol

CIRCLE 405 ON READER SERVICE CARD

LATEST Mac S·A·L·E INTERNATIONAL SPECIALS

* CLEARANCE ITEMS *

**New Toner for Select 300/310/360 — $69.00

USED ITEMS

Mac Plus	No Kbd or Mouse	$99.00
Mac II	1/0	$199.00
Mac II	4/40	$299.00
*Add 8 Bit Video Card		$50.00
Apple Hi-Res Mono Monitor		$69.00
Mac IIci Cache Cards		$15.00
LaserSelect 300		$349.00
Stylewriter II		$189.00
ImageWriter II		$199.00
Apple OneScanner		$249.00
Apple Color OneScanner		$499.00
PB Express Modems		$99.00
Apple CD 150 Ext. Drive		$129.00
**Personal Laser LS		$279.00

Hewlett-Packard DeskWriter550C — $299.00
Color InkJet Printer (Factory Refurb)

* NEW *

Quadra 630 4/250	$899.00
Apple Color Plus Display	$299.00
Laser IIf Logic Bd (Upgrade)	$349.00
Laser NTR Logic Bd (Upgrade)	$299.00
Apple One Scanner	$399.00
Ext. Hard Drive Case	$69.00
Extended Keyboards	$75.00

* USED *

Mac SE (800K)	1/0	$225.00
Mac SE (FDHD)	1/0	$325.00
Mac LC	4/80	$379.00
Mac LC II	4/40	$399.00
Mac LC II	4/120	$429.00
Mac Portable	2/40	$350.00
Mac IIX	4/80	$675.00
Mac IIFX	4/80	$799.00

(Other Configurations Available)

Apple 8 Bit Video Cards	$85.00
Apple 15" MultiScan (Refurb)	$399.00
Apple 14" Color Display	$350.00
Apple 16" RGB Display	$649.00
Apple Extended II Keyboards	$115.00

* HUGE SAVINGS ON NEW *

Performa 575
8/250 W/CD
68040 33MHz
$1,299.00

$129.00
Apple 12"
Mono Monitor

Apple Newton MessagePad
Now truly affordable...
Only $129.00

New MS Word/Excel Bundle - $79.00
ONLY $49.00 With Any CPU

New Apple 8•24 Video Card - $129.00
ONLY $99.00 With Any CPU

New NEC CD Drive - $69.00
Includes: DRIVE 7 & The Merchant CDs

FACTORY REFURBISHED

Performa 550
5/160 W/CD
68030 33MHz
$899.00

Performa 466
4/160 68030 33MHz
INCLUDES:
Performa Plus Color Display, Keyboard, Mouse & ClarisWorks

$729.00

USED ITEMS

Mac LC II
4/120 W/Kbd & New
Apple 12" Mono. Monitor
$499.00
*For Color System: Add $150

COLOR CLASSIC 4/80
KEYBOARD & MOUSE
$749.00

We Now Feature A Huge Inventory Of Parts For All Apple Products And Also Offer Extended Warranties On All Apple Equipment

Limited Quantities/Prices subject to change
Prices represent a Discount - off Full Price
Returns at discretion of Mgmt./15% Restocking fee

1-800-729-7031

1150 W. Alameda Dr.,Ste.1&2,Tempe, AZ 85282
(602) 858-0900 /(602) 858-9537(Parts)

WE WANT TO BUY YOUR NEW/USED MAC EQUIPMENT

CIRCLE 401 ON READER SERVICE CARD

CALL THE MAC EXPERTS!

You won't find anyone with more Macintosh expertise than the experienced consultants at PowerMax™. Give us a call today for a competitive quote and expert advice. Make our knowledge your power!

PowerMax Trinitron™ monitors are designed specifically for the rigorous demands of the Macintosh. They ship complete with Mac-ready cables and adapters, a three year warranty, and our satisfaction guarantee: if the monitor is not just right, we'll replace it for you!

Mac CPUs & Powerbooks

630 w/fpu, 4 mb ram	$849
PowerMac 6100/66 8 mb ram	$1419
PowerMac 7100/80 8 mb ram	$2315
PowerMac 7100/80 AV 8 mb ram	$2736
PowerMac 8100/110 System	$Call!
WorkGroup Server 6150/66	$Call!
WorkGroup Server 9150/120	$Call!
PowerBook 150 4/120	$1049
PowerBook 520 4/240	$1777
PowerBook 520C 4/240	$2267
PowerBook 540C 4/320	$Call!

Authorized Distributor for the new Mac Clones! Call for details!

Monitors, Printers & Scanners

Samsung 17GL 17" .28 Color Monitor	$685
Diamond Pro 15FS 15" .28 Color Monitor	$439
Radius IntelliColor 20" Trinitron Monitor	$1956
AppleStyleWriter II	$219
NEC Superscript Model 640 Laser	$718
Xante 11x17 Laser- Authorized Dealer!	$Call
Epson 1200C Scanner	$949

Monitors we stock: Apple, CTX, Mag Innovision, Magnavox, Mitsubishi, NEC, Panasonic, PowerMax, Radius, Rasterops, Samsung, Sony, SuperMac.
Printers we stock: Apple, CoStar, DataProducts, DEC, Fargo, GCC, Hewlett Packard, Kodak, NEC, Okidata, QMS, Seiko, Texas Instruments, Xante.
Scanners we stock: Agfa, Apple, Canon, Epson, Hewlett Packard, Microtek, Sharp, Umax, Visioneer.

PowerMax drives come complete with a double-shielded SCSI cable (50/50 or 50/25), Drive Seven formatting software, up to a 5 year warranty, and a 30 day money back guarantee!

PowerMax Hard Drives

PowerMax Ext. 350 Meg. Drive	$249
PowerMax Ext. 500 Meg. Drive	$319
PowerMax Ext. 700 Meg. Drive	$369
PowerMax Ext. One Gigabyte Drive	$599
PowerMax Ext. Two Gigabyte Drive	$1129
PowerMax Ext. Four Gigabyte Drive	$1749

We specialize in high-end array systems!

PowerMax Trinitron™ Monitors

Model PM15T
15" Trinitron™ Aperture Grill
.25 mm Dot Pitch
Resolutions up to 1280x1024
Power Saver Mode, Auto-Degauss, Tilt/Swivel.
$449
Compare to Sony 15SF at $479 (plus adapter)

Model PM17T
17" Trinitron™ Aperture Grill
.25 mm Dot Pitch
Resolutions up to 1280x1024
Power Saver Mode, Auto-Degauss, Tilt/Swivel.
$789
Compare to Sony 17SF at $949 (plus adapter)

Model PM17TE+
17" Trinitron™ Aperture Grill
.25 mm Dot Pitch
Resolutions up to 1600x1280
Power Saver Mode, Auto-Degauss, Tilt/Swivel.
$999
Compare to Sony 17SE at $1099 (plus adapter)

Model PM20T
20" Trinitron™ Aperture Grill
.31 mm Dot Pitch
Resolutions up to 1600x1280
Power Saver Mode, Auto-Degauss, Tilt/Swivel.
$1849
Compare to Sony 20SE at $2099 (plus adapter)

POWER MAX
Knowledge is Power

800-844-3599

24 hour fax line: 503-232-7101
(West Coast -but we're not in California!)

Available terms include: COD, Visa, MasterCard, Discover, American Express and Company PO's.

Ask about our fantastic business leasing programs!

CIRCLE 446 ON READER SERVICE CARD

MICRO OUTLET
800-801-4MAC

Phone: 800-801-4622

Fax: 310-533-0501 / Email: MicroutIt@aol.com
C.O.D. / MasterCard / Visa / Discover
AmericanExpress
LEASE Plans Available
NEW EQUIPMENT ONLY

PowerMac

POWERMAC	604s	CALL
6100/66	8/350	$1599
6100/66	8/350/CD	1799
6100/66	16/500/DOS	2495
6100/66	16/1GB/CD	2525
7100/80	8/500	2625
7100/80	8/700/CD	2795
7100/80	16/1GB/CD	3425
7100/80	16/2GB/CD	3775
7100/80AV	16/700/CD	3295
8100/100	8/700	3225
8100/100	16/700/CD	3995
8100/100AV	16/1GB/CD	4165
8100/110	16/2GB/CD	5695

PowerBook

150	4/120	$ 995
150	8/120	1165
520	4/160	1525
520	12/160	1825
520	12/160/FM	2125
520C	4/160	1875
520C	12/320	2475
520C	12/320/FM	2825
540C	4/320	2895
540C	12/320	3225
540C	12/320/FM	3525
540C	12/500/FM	3725
540C	36/500/FM	4550

Quadra

605	4/160	$ 749
630	4/250	949
630	8/250	1098
950	8/0	2750

Monitors

Apple ColorPlus 14"	$285
Apple Multiscan 15"	459
Apple Multiscan 17"	875
Apple Multiscan 20"	1950
Sony CPD15SF1 15"	449
Sony CPD17SF1 17"	859
Sony GDM17SE1 17"	1035
Sony GDM20SE1 20"	1950
NEC XV15 15"	475
NEC XE17 17"	1095
ViewSonic 15ES 15"	369
ViewSonic 20PS 20"	1499
SuperMatch 21TXL	2049
Intellicolor 20(e) 20"	1899

CD Rom

Pinnacle RCD1000	$1675
Verbatim 74min.CD(qty.10)	105
Apple 300iPlus	269
Apple 300ePlus	269
Apple 600e	CALL
NEC 4X External	499
NEC 6X External	585

Hard Drives

Apple	250MB 3.5"	$159
Apple	350MB 3.5"	189
Quantum	540MB 3.5"	259
Apple	730MB 3.5"	289
Conner	1GB 3.5"	429
Seagate	2GB Barracuda	CALL
250MB	External 3.5"	235
350MB	External 3.5"	265
540MB	External 3.5"	335
730MB	External 3.5"	365
1GB	External 3.5"	489
2GB Barracuda	Ext.	CALL
Iomega ZIP 100MB		199
ZIP 100MB	10Pack	149

Scanners

Visioneer	PaperPort	$349
AGFA	StudioScan	675
AGFA	StudioScan II	825
HP	Scanjet IICX	979
HP	Scanjet IIIP	495
UMAX	Vista-T630	585
UMAX	Vista-S6	649
UMAX	UC1260	895
MicrotekScanMaker III		2479
MicrotekScanMakerIIHR		835
Epson	800C	759
Epson	1200C	999

Software

Kai Power Tools & Bryce	$ 229
Adobe Photoshop 3.0.1	529
Adobe Premier4.0	525
MacroMedia Director4.04	849
Pagemaker	579
Fractal Painter3.0	329
FormZ 2.7	SPECIAL
SoftWindows	259
Filemaker Pro	89
Adobe Illustrator 5.5	359
QuarkExpress	679
ClarisWorks	CALL

Modems

Supra Express Plus	$ 98
Supra 144LC	135
Supra 288	225
Supra 28.8PwrBk Internal	CALL
GlobalVillage Teleport 28.8	225
GlobalVillage Teleport 19.2	269
GV Powerport 28.8	CALL
GV Powerport 19.2	315

Printers

Apple StyleWriterII	$199
Color StyleWriter2400	499
Color StyleWriterPro	599
ApplePortableStyleWriter	349
Apple Select 360	1199
Apple 16/600	1899
HP 5ML	CALL
HP 5MP	CALL
HP LaserJet 4MV	2795

Misc.

AppleDesign Keyboard	$ 80
Apple Extended II Kbd	150
OpticalMouse	69
WacomARTZ 6x8tablet	279
Radius Videovision Studio	
Ethernet Transceivers	79

LEASE SPECIALS

LOW RATES • *FAST* TURNAROUND
LOW DOWN
100% TAX DEDUCTIBLE

ULTRA Design Station

PowerMac 8100/110 80/2Gig/CD
SuperMatch 21TXL Monitor
SuperMac Thunder IV GX 1600X1200
Apple Design Keyboard
Syquest 200 Meg Hard Drive

308.00 PerMo.

Design Station

8100/100AV 32/1GIG/Cd
Sony 17" SF1 Monitor
Apple Design Keyboard
Syquest 200MB Drive

175.00 Per Mo.

DTP Smartlease

7100/80 16/1GIG/CD
SuperMatch 21TXL
Apple Design Keyboard
Microtek ScanMaker III
HP Laserjet IVmv 11X17 Printer
Quark Express • Adobe Illustrator

278.00 Per Month

Prices quoted are cash prices and are subject to change without notice. Returns subject to 15% restocking charge.
2785 Pacific Coast Highway 178 • Torrance, CA • 90505

CIRCLE 472 ON READER SERVICE CARD

COMPUTER GRAPHIC & NETWORKING

We custom configure and test your system. Specialized in Pre-Press, Publishing, Digital Video products.
WE BUY - SELL - TRADE
FREE MOUSE PAD WITH EVERY ORDER

PowerMacs

8100 110/72-2.GB	$CALL
8100 100/136-2GB	6990
8100 AV 40-1GB	4990
8100 40-1GB	CALL
8100 80/100/110 8-0	CALL
7100 40-1GB	3725
7100 16-700-CD	3065
7100 16-700- AV	3445
7100 8-0	CALL
6100 16-500-CD	2089
6100 24-500-Dos Card	CALL
6100 8-0	CALL

Powerbooks

540c 20-840	$3995
540c 12-320	3145
540c 36-540	CALL
520C 12-240	2330
520c 20-540	2895
520 12-160	1899
520 8-320	2045

Demo Powerbooks

180 8-160	1590
145 - 170 -160-165c	CALL
180C 8-160	1790
Duo 230/250	CALL

Upgrades

Q/Ctrs 650 to 7100	$ 999
Quadr 840 to 8100/100	1940
Q840/800 to 8100/110	2295
Mac II Ci to 7100	1425
Q/Ctrs 660AV to 7100	CALL
Quadr 950 to 9150	899
Quadr 610 to 6100/66	875
PB 180 to 520c	799
PB 180C TO 540C	CALL
All PowerBook Upgrade	CALL
Si-LCII-Q700 to Power PC	CALL
Call for DEMO units & Upgrades	

Printers

Select 360	1099
HP 1200c	1095
HP Lase 4M Plus	CALL
ProB10 20PM	2690
Call forNewGen - QMS	

Demo Macs

8100/80 8-500	2245
7100 /66 8-250	CALL
Q840	1890
Preforma 630	740
Server9150 (5 Nubus)	2190
Q650/660AV/Ci	CALL

Hi-End

Power Mac 8100 /100
72MB RAM - 2GB HD
20" Monitor
Extended Keyboard
$7990

Power Mac 7100/80
40MB RAM - 1GB HD-2Vram
17" Monitor
Ext Keyboard Mouse Pad
$4890

Power Mac 6100/66
16MB RAM - 1.GB HD -Dos
15" Monitor
Ext Keyboard Mouse Pad
$3090

VideoCard

Video Vision Studio 2.0	$3190
Prec. Color Pro 24X	699
Thunder II GX1360/1600	999
Thunder IV GX 1600/1360	CALL

Call for: SuperMac-Radius-RasterOp

We Pay Top $$$ For Your Mac

TRADE YOUR MAC FOR NEW ONE

Prices are subject to change.

TEL: 310-441-4771 10922 Pico Blvd. Los Angeles, CA 90064 **Fax: 310-441-4770**

CIRCLE 432 ON READER SERVICE CARD

MAC CITY COMPUTERS

QUALITY SERVICE AND VALUE SINCE 1987
NO SALES TAX OUTSIDE CALIFORNIA
WE GUARANTEE LOWEST PRICES
Prices are Subject to change without notice!

INTERNATIONAL ORDERS
VISA & MC AMERICAN EXPRESS C.O.D Welcome

SALES (800)505-8991

Tel: (818) 505-8991
Fax:(818) 505-8992
11026 Ventura Blvd STUDIO CITY, CA 91604

POWER MAC

8100/100 16-1G CD 3999, 8-700 3229	8100/110 16-2G 144-2G CALL
7100/80 16-700 CD 3099, 16-500 2849	7100/80 AV 16-700 CD 3299, 16-0 Call
6100/66 16-350 CD 2099, 8-350 1579	6100CD/66DOS 16-500CD 2399, 8-250 CD Call

8100/100 AV	16-1G CD		4199
8100/100	8-0		3099
8100/80	8-0 / 16-500 CD	2599 /	3199
7100/66AV	16-500 CD		2849
7100/66	8-0 / 16-500 CD	1899 /	2599
6100/60	8-0 / 8-250	Call /	1299

CALL FOR ANY CUSTOM CONFIGURATIONS

Powerbook

540C	4-320	2999
	12-320	3399
	20-500	3749
520C 520	8-160 NEW, 12-320 LOW, 4-160 PRICE	

150	4-120	1249
Duo	280c 4/320	2999
Duo	280 /270c	Call
G.V. Mercury FAX		315
4MB RAM		169
8MB RAM		329
16MB RAM		599
32MB RAM		Call

Call for lowest prices

Mac Performa

Per 475	979
Per 630cd	1499
Per 638cdv	1899
Per 6115	2349

Quadra

Q630 4-250	959
Q630 8-250	1139
Q605 4-160 w/soft	749
Q650 8-250	Call
Q610 8-250	1299
Q950 8-0	Call

HARD DRIVES

CONNER 2.1g	799
CONNER 1g	549
Quantum 700	329
Quantum 540	279
Quantum 350	229
Quantum 170	169
160mb f/PB	129
340mb f/PB	319

Monitor

Apple 14" PLUS	289
Apple 15"	465
Apple 17 Multi	949
Apple 20T Multi	1899
SONY	
Sony 17Se1	929
Sony 17sf	879
Sony 15sf	439
Sony 20SE	1795
RADIUS	
Rad prec 21" flat	1969
Rad 20c 20"	1799
Rad color pivot	799
NEC	
Nec 3v 15"	469
Nec xe15	569
Nec xp17	1229
Nec xe17	929
Nec xe21	2029
SUPERMAC	
Sup 17T	849
Sup 21TXL	2099
Thunder IIgx 1360	2239
24xk	739

Printer

Pro 630	1799
Pro 16/600	2225
Select 360	1249
Select 320	859
Stylwriter II	279
Color 2400	Call
Stylwriter color pro	569
HP	
HP4ML	969
HP 4MP	1299
HP 4MPlus	1899
HP 4MV	2719
HP Deskwriter 560c	465
HP Deskwriter 540	296
HP D.W 320	304

Scanners

Microtek 35T	959
Microtek IIhr	999
Microtek iisp	769
Umax UC840	669
UmaxUC 1200SE	1486
AGFA Arcus II	1597

WE SELL ONLY BRAND NEW PRODUCTS

CIRCLE 442 ON READER SERVICE CARD

Trade In Your Old MAC For A New MAC

PowerMACS

8100/110/16/2G/CD	$5570
8100/100/8/700/CD	$3485
8100/80/8/500	$2890
7100/66/8/500/CD	$2085
7100/80/AV 24/700/CD	$3535
7100/80/8/700	$2530

Monitors

RADIUS
SONY
NEC

14" Apple RGB	$425
14" Apple Color Plus	$290
15" Multiscan	$455
17" Multipli	$860
20" Apple Color	$1835
21" Apple RGB-R	$1470

Printers

EPSON
GCC
HP

Laser Wr. 16/600	$1995
Laser Pro 810	$3290
Laser Wr. Select+ 360	$1435
Laser Wr. 320	$935
Color Stylewriter 2400	$430
Laser Wr. Select 310	$575

Powerbooks

Trade Your Old POWERBOOK for a NEW 500 SERIES

PB 540C /8/500	$3350
PB 520C /8/320	$2350
PB 520 /8/320	$1890

iCN
INTERNATIONAL COMPUTER & NETWORKING
TRADE-INS • UPGRADES • SYSTEMS • PARTS

Quadras

950 8/0-D	$2695
840AV 8/230-D	$2435
800 8/230-D	$2170
700 4/230-U	$1495
650 8/230-D	$1895
660AV 8/230-D	$1495
605 4/160	$745

Specials

Performa 630 4/250-FPU
14" Color Monitor, Keyboard
$1200

Mac LC 520 5/80/CD
14" Color Monitor, Keyboard
$950

Quadra 605 4/160
14" Color Monitor, Keyboard
$1050

Upgrades

COMPLETE UPGRADES

Trade or Upgrade Your Mac For A PowerMac

Q610, C610, Q660 To 6100/60/66
$850/$895

IIVX, Q650, C650 To 7100/66/80
$1250/$1450

Q800/Q840AV To 8100/80
$1645

Q800/Q840AV To 8100/100/110
$2550/$3100

8100/80 To 8100/100/110
$1600/$2150

LCII/LCII To Q605
$495

Large Inventory of Parts Available for Overnight Delivery

Upgrade Your Macintosh To A PowerMac 8100/110MHz

2045 B, South Barrington Avenue Los Angeles, California 90025

PRICES ARE CASH & SUBJECT TO CHANGE

310-445-6600 *We Buy & Sell New & Used MACS* *FAX 310-445-6611*

CIRCLE 439 ON READER SERVICE CARD

TEL. (818) 719-9200
FAX. (818) 719-9115
MAC PROFESSIONAL INC.

MAC PROFESSIONAL INC.

• No Tax Outside CA. • Dealers & International Orders Welcome •
6430 Variel Ave. #105, Woodland Hills, CA 91367 • 1YR. Warranty

POWER MACS

	8 / 0	8 / 500	16 / 700	24 / 1000	40 / 2.0 GB	72 / 2.4 GB	136 / 4.0 GB
6100 / 66	1475	1750	1995	2495	3350	4195	—
6100 / 66DOS	—	—	2450	2995	3795	4650	—
7100 / 80	2355	2555	2888	3355	4195	4995	7255
7100 / 80AV	2755	2955	3255	3755	4350	5450	7755
8100 / 100	2995	3225	3495	3995	4750	5850	8400
8100 / 100AV	3450	3650	3995	4395	5250	6295	8695
8100 / 110	4395	4650	4895	5395	6295	7250	9595

• APPLE CD 300 I PLUS ADD $240 • QUAD SPEED APPLE CD ADD $325 • 1 MB V RAM ADD $75 • 2 MB V RAM ADD $150 •
PRICES ARE C.O.D. AND ARE SUBJECT TO CHANGE WITHOUT NOTICE
• NEXT DAY AIR AVAILABLE • VISA MASTERCARD AMEX ACCEPTED

POWER BOOKS

540c	12/320	3195
540c	20/320	3444
540c	12/500	3444
540c	20/500	3695
540c	20/800	3865
540c	36/800	4495
520	8/240	1895
520	12/320	2295
520c	8/240	2395
520c	12/320	2695
520c	20/500	3095
520c	20/800	3395
MERCURY MODEM		329

QUADRAS

630	CALL
950	CALL

PRINTERS

CLR STYLEWTR 2400	444
CLR STYLEWTR PRO	595
LASER 320/360	888/1195
LASER 16/600	2155
HP 540/560c	297/497
HP 5MP	1077
HP 4MV	2747
HP 1200 CPS	1595
GCC 608	2450
GCC 808	2935
GCC 1208 NEW	3835
FARGO PRIMERA	895
FARGO PR. PRO	1395
NEC SP.SCRIPT 3000	985
NEC SP. SCRIPT 640	775
QMS PRINTERS	CALL
CITIZEN NOTEBOOK PRINTER II	
W/COLOR KIT	229

SCANNERS

PIXEL CRAFT 4000	2125
PIXEL CRAFT 7000	7995
PIXEL CRAFT 8000	10195
AGFA ARCUS II	2555
AGFA STUDIO SCAN II	827
AGFA HORIZON	16450
SCANMAKER III	2575
SCANMAKER II HR	1075
SCANMAKER II SP	825
SCANMAKER II SPX	975

PERFORMA

630 8/250-CD	1497
635/637	CALL
6112	CALL
6115	2295

PINNACLE MICRO

OPTICAL TAHOE 230	847
OPTICAL SIERRA 1.3	2377
RECOD. RCD 1000	1777

MONITORS

FULL PAGE	339	15" MULTI	487
17" MULTI	977	20" MULTI	1947

SONY / NEC

15 SF	467
17 SF	899
20 SE	1885
XE 15	555
XE 17	967
XE 21	1995

RASTER OPS

17"	875
20" TRINI	1695
21" GREY	675
17 T	797
17" PRECI	967
20 E INTELLI	1875

• WE SPECIALIZE IN CUSTOM MADE CONFIGURATIONS • SINCE 1988 • BUSINESS LEASING AVAILABLE •

CIRCLE 495 ON READER SERVICE CARD

COMPAQ · HEWLETT PACKARD · radius · Microsoft · FUJITSU · IBM · SUPERMAC. · RELISYS · XANTE

POWERMAC

6100 /66 8/350	$1635
6100 /66 8/350CD	$1835
7100/80 8/500	$2635
7100/ 80AV	CALL
8100 /100 8/700	CALL
8100 /110 16/2gig cd	$5999
PM AV CARD	$439
PM DOS CARD	$689

SUPERMAC / SONY

17T	$899
17SF	$899
20 PLUS	$1399
20TXL	CALL
THUNDER IV	CALL
THUNDER 24	CALL
CPD 15SF	$485

POWERBOOK

150 4/120	$1029
150 4/250	$1329
520 4/160	$1599
520C 4/160	$2279
520C 12/320 mod.	$2899
540C 4/340	$3399
540C 12/320M	$3995

PRINTERS

LWRITER 360	$1469
LWRITER16/600PS	$2275
HP 4M	$1299
HP 4M+	$1950
HP 4MP	$1395
HP 1200 C/PS	CALL
STYLEWRITERII	$269
STYLEWRITER2400	$499

RADIUS/ NEC

INTELCOLOR 20E	CALL
PRECISION 17	CALL
PC 24X	$875
PC24XP	$299

SCANNERS

UMAX 630LE	$629
UMAX 840	$899
UMAX 1260	$1099
SCANMAKER II SP	$829
SCANMAKER II G	$499
HP SCANJET IICX	$995
HP SCANJET IIIP	$499
EPSON ES 1200	$1279
RELISYS	CALL

CALL ON ALL SOFTWARE

WORDPERFECT MAC	$245.
MICROSOFT WORD MAC	$249.

APPLE INTERNAL SUPERDRIVE. $149 w/ Exchange

CALL ABOUT OUR NEW TRAINING CENTER
PHOTOSHOP, QUARK, ILLUSTRATOR AND MORE !
PLUS MACBASICS

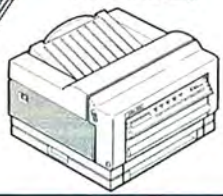
GCC TECHNOLOGIES

We carry a full line of GCC Printers

SELECTPRESS 1200
$5899.00
$213. a month leasing

ELITE XL 608 / 808
$2449.00 / 2999.00
$99. / $119.
a month leasing

ELITE 600
$1329.00
$62.
a month leasing



Computer Revelations Inc.
1 800 275-9924
in NY 516 737-0800

CALL US FOR ALL OF YOUR LEASING NEEDS !

331E DANTE COURT HOLBROOK NY 11741 FAX 516 737-0923
NEW & USED BOUGHT & SOLD
Ask about our EXTENDED WARRANTY

CIRCLE 474 ON READER SERVICE CARD

COMPU AMERICA
"The computer Specialist"
Catalog Dealer

1-800-533-9005
Sales (310) 446-1771 • FAX (310) 475-7744
Let us custom configure your system. Dealers Welcome.
FedEx next day shipping available.

POWERMAC

6100/66	8/350	1589
6100/66	8/350/CD	1849
6100/66	16/500/CD/DOS	2589
7100/66	8/500	1999
7100/66	40/1GIG/CD	3439
7100/80	8/500	2499
7100/80	8/700/CD	2879
7100/80	40/2GIG/CD	4599
7100/80AV	16/700/CD	3339
8100/80	16/1GIG/CD	3699
8100/80AV	16/500/CD	3599
8100/100	8/700	3299
8100/100	16/1GIG/CD	4299
8100/100	72/2GIG/CD	6099
8100/100AV	16/1GIG/CD	4399
8100/100AV	136/2GIG/CD	8349
8100/110	16/2GIG/CD	5799
8100/110	72/2GIG/CD	7599
8100/110	136/2GIG/CD	9699

CALL FOR WORKGROUP SERVERS

QUADRA

605	4/160	749
610	8/230/DOS	1499
630	4/240	1049
950	8/NO HD	2799

PERFORMAS

476	4/240	999
630CD	8/250/CD	1399
635CD	5/350/CD	1599
6115	8/350/CD	2299

POWERBOOKS

150	4/120	1049
520	4/160	1549
520	4/240	1779
520C	4/160	1899
520C	12/320/FAX	2799
520C	4/240	2095
540C	4/320	2799
540C	12/320/FAX	3499
540C	12/500/FAX	4099
DUO 280	4/240	2199
DUO 280	12/240/FAX	2699
DUO 280C	4/320	2949
DUO 280C	12/320/FAX	3695

PRINTERS

StyleWriter II	229
StyleWriter 2400	449
Epson Stylus	549
Apple LaserWriter Select 360	1099
Apple LaserWriter 16/600	1949
Apple LaserWriter Pro 630	1599
Apple LaserWriter Pro 810	3395

MONITORS

Apple 14"/15"	289/429
Apple 17"/20"	849/1929
Sony 15SF/17SF	439/859
Sony 17SE1/20SE1	949/1799
SuperMAC 17T	939
SuperMAC 21TXL	2099

10435 Santa Monica Blvd. LA, CA 90025
All prices subject to change without out any such discount.

CIRCLE 467 ON READER SERVICE CARD

LOWEST PRICES BEST SERVICE

POWER MAC

6100 - 66 8/350/CD $1775
7100 - 80 8/700/CD $2788
7100 - 80 32/2GIG/CD $4595
7100 - 80AV 16/700/CD $3195
7100 - 80 24/1 Gig/CD $3595
7100 - 80 40/2 GIG/CD $4275
8100 - 80 8/0 $2495
8100 - 80 16/500/CD $3275
8100 - 100 8/700 $3494
8100 - 100 40/2 GIG/CD $5450
8100 - 100AV 16/1 GIG/CD $4594
8100 - 110 16/2 GIG/CD $5598
8100 - 110 40/4 GIG./CD $6757

1-800-799-4MAC

POWER BOOK
540C 4/320 $2898
540C 12/320/Modem $3585
520C 4/160 $1989
520 4/160 $1575
150 4/120 $1089
All Powerbook Duos - Call

QUADRA
950 8/0 $2795
950 16/1GIG $3450
630 4/250 $1045
650 8/230 $1985
Mac Clones Now Avail.

PRINTERS
Apple
HP

SCANNERS
U-Max
HP / AGFA

MONITORS
Apple
Super Mac
Radius
Sony
NEC

We will beat any verifiable price!
Call for any custom-made configurations or quotes on New Generation Power Macs
Tel: 310-358-9000
Fax: 310-358-9100

COMPU AGE
THE SOURCE TO MACINTOSH WORLD
318 N LA CIENEGA •LOS ANGELES, CA 90048

Same Day Shipping
Dealers/ Intl. Orders Welcome
Prices subject to change due to publication lead time.

TRADE-INs Welcome

CIRCLE 542 ON READER SERVICE CARD

Systems Parts Upgrades

Specials — Bargains Aplenty!

SE Power Supply	129.
SE Analog Board	149.
PowerBook 140-180c keiboard	69.
Nubus Adapter-Quadra 660av	99.
Dos Card for Quadra 610	199.
IIcx/IIci Power Supply	149.
1200 Baud Personal Modem	29.
LC Ethernet Board	49.
CRT & Yoke Assembly	49.
Mac Plus Keyboard	69.
Mac Plus Mouse	69.
Portable 2400 Baud Modem	49.
Toshiba 1x CD-ROM Drive	99.
AppleTalk Internet Router	39.
AppleDesign powered speakers	99.
Personal NT Logic Bd.	149.
Mac Plus Power Supply	119.

MONITORS

Apple 14" Basic Color VGA	169.
Apple Portrait Display	299.
E-Machines E20 (New)	1199.
E-Machines T16/II trinitron (New)	799.
14" High-res trinitron 832x624	349.
New Radius Color Pivot/le and card	699.

Jabra A/V EarPhone
Hands-free telephone communications through your Mac A/V computer and GeoPort Telecom Adapter!
Voice-activated Dialer software included.
Only $79 new

LOGIC BOARD EXCHANGES!

Mac IIx to IIfx: $399
40 MHz, math co-processor, wicked-fast!

Brand New! IIvx to Centris 650: $499
25 MHz 68040, Built-in Ethernet

IIci to Centris 650: $499
Price includes installation!

LCIII to Quadra 605: $349
LC'040 at 25MHz

Centris 610 to Quadra 660av: $399
25 MHz, floating point unit, Ethernet, A/V Technology

Quadra 800 to 840av: $499
40 MHz 68040, A/V Technology, 66 MHz DSP

E-MACHINES DOUBLECOLOR SX

Accelerated 8-bit • Hardware Pan & Zoom
Virtual Screens • Monitors up to 16"

Ink refill kits available!

11x17 $649 New

Apple® Color Printer
11x17 • 360 dpi • ColorSync color-matching • SCSI or parallel interface
64 scalable TrueType fonts
Canon BJC-820 engine

Shreve Systems
1200 Marshall St. Shreveport, Louisiana 71101
FAX 318-424-9771 • Technical Support 318-424-7987
Customer Service • Purchasing • Info 318-424-9791

ORDERS ONLY 800-227-3971

All equipment is used or demo unless indicated "new". Refurbished equipment carries a 120-day warranty. Returns subject to a 20% restocking fee. Prices subject to change and reflect a 2% cash discount.

CIRCLE 425 ON READER SERVICE CARD

THIS SEEMS TO BE THE MENTALITY OF MOST COMPUTER COMPANIES.

NOT AT AEON
You can't stand wasting time. Nor can we. We are a bunch of nerds who understand the things we sell. It's really that simple.

AEON

BENEFIT FROM THE FACT THAT WE HAVE NO LIFE AND SIT AROUND MAKING THIS STUFF WORK.

HTTP://AEON.COM SALES@AEON.COM

800-937-2366

Aeon 230 MO Drive: $649

Aeon 4X CD Rom Drive: $399

Aeon 1Gig Drive: $639
Seagate External HDD

230M MO media: $31
128M MO media.....$17

Aeon 1.3Gig MO Drive	$1,699
Aeon 4.2Gig Seagate External HD	$1,699
230M formatted MO Media	$33
650M MO Media	$62
1.3Gig MO Media	$83
CD-R Media 74min (TDK/Maxcell)	$12
CD-R Media 74min (Sony)	$13

64M SIMM: $2,249
PowerMac 6100 True 64 Meg

AEON TECHNOLOGY - Mon-Fri 9am-6pm and then some, CST 9111 Jollyville Road Suite 218
Austin TX 78759 Local: (512) 338-4834 Fax: (512) 338-1665

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE • CALL FOR RMA BEFORE RETURNING MERCHANDISE • RETURNS SUBJECT TO A RESTOCKING FEE • ALL BRANDS & PRODUCT NAMES ARE TRADEMARKS OF THEIR RESPECTIVE HOLDERS

CIRCLE 437 ON READER SERVICE CARD

TEL : 818-901-6250

FAX : 818-901-6260

MACMAN
COMPUTER WAREHOUSE

Adaptive Solutions® POWERSHOP™
Fastest image processing accelerator for Adobe Photoshop
Authorized Reseller, please call for prices.

Wholesale Prices To Public!
Networking, Service & Repair Available
Fax Your Order 24 Hours A Day!

MONITORS

Apple MultiScan 15"/ 17"/ 20"....$495-935-1939
Sony 20"SE/ 17"SF/ 15"SF.....$1879-899-468
Raduis Precision 20e/ Press View 21T.....$1850-2992
Raduis Precision 17"-2 Page 21 GS.....$995-980
SuperMatch 21TXL/ 20 Plus/ 17T..$1999-1425-845
NEC Multisync XE21/ XP17/ XE15.$2040-1294-567

POWERMAC 8100

8100/110 16MB/2GB/CD.....$5725
8100/110 136MB/4GB/CD.....$9885
8100/100 40MB/1GB/CD.....$4650
8100/100 136MB/2.4GB/CD.....$7875
8100/100 AV 16MB/2GB/CD.....$4595
8100/80 24MB/500HD/CD.....$3479
SUPER VALUE 8100/100 72 RAM/2.4GIG/CD 4MBVRAM/20"C.Display/KeyBd $8400

PERFORMA

550/33MHz 5/160/CD/14" Mon/K.B./FaxM.....$1545
578/33MHz 8/350/CD/14" Mon/K.B./FaxM.....$2155
638/33MHz 8/350/15" Mon/K.B./FaxM.....$1755
6115/60MHz 8/350/15" Mon/K.B./FaxM.....$2529

OPTICAL/STORAGE

PinnacleMicro Sierra1.3-Tahoe 230...$2350-825
PLI SyQuest 270 Ext - 200C Ext.....$459-559
Kodak Writable CD Bundel Writer.....$825

Raduis **VIDEO CARDS** SuperMac

Spigot Power AV/ PrecisionC. 24XK.....$747-719
Video Vision Studio v2/ P'Color 24X.....$3476-898
Stage 2 Roket/ Thunder 24GT.....$1699-1345
Thunder IVGX 1152/1360.....$1899-2295
Thunder IVGX 1600.....$2824
Spectrum Power 1152/ Spec. Ser. 24....$1225-899

7100/6100 & QUADRA

7100/80 16MB/500HD.....$2855
7100/80 40MB/1GBHD/CD.....$4138
7100/80 AV 32MB/700HD/CD.....$3995
6100/66 16MB/350HD.....$1999
6100/66 24MB/700HD/CD.....$2337
Q. 950 40MB/1GB/CD.....$4795
Q. 630 4MB/250HD/CD/14" C.Monitor/K.B./M..$1505

DRIVE	CAPACITY	SPEED	INT	EXT
Quantum	1080MB	9.5ms	$545	$593
Quantum	2140MB	8.6ms	$1065	$1155
Seagate	2.4GB	8ms	$1125	$1195
Seagate	4.2GB	8ms	$2195	$2285

Lowest Price on Memory!!! *Call Now!*

8MB 72pin 70ns/60ns.....$310 $321
16MB 72pin 70ns/60ns.....$490 $499
32MB 72pin 70ns/60ns.....$999 $1010

PRINTERS

Apple Stylwriter C2400/ Color Pro $453-594
Apple Laser 360/ 16/600.....$1289-2225
HP 5MP/ 4MV/ 1200 C/PS.....$1075-2746-1593
NewGen ImagerPlus/ Design Exp.B...$5783-5592
Kodak 450GL Digital C./ ColorEase..$1835-5349
GCC Select Press 600Pro/ 1200.....$4685-5895

POWERBOOK

150 4/120-8/120.....$1275-1465
520 4/160-8/320w/modem.....$1639-2579
520C 4/160-20/500w/modem.....$1849-2429
540C 4/320-12/320w/modem.....$2945-3645
Duo 280C 4/320-12/320w/modem.....$3185-3849
Duo Dock II- Mini Dock.....$899-299
Call for the updated price on any configuration!

SCANNERS

Agfa Studio Scan II/ Arcus Plus II....$865-2565
Kodak RFS 2035 Plus Film Scanner....$6735
Nikon Scantouch 1200/ CoolScan....$6735-1759
Microtek ScanMaker III/ IIHR/ II..$2459-989-485
Microtek ScanMaker IISP/ IISPX/IIG...$745-890-383
Umax PowerLook/ UC1260 w/P.S.....$2276-1084
Umax Vista S8 w/P.S/ S6 w/P.S.LE..$965-844
Epson Actionscanning/ ES-1200C...$Call-1249

- Due to publication time advertised prices may vary. All prices includes cash discount.
- All products carry one year minimum manufacturer's warranty on parts and labor.
- Non-Defective Returns or Shipped Orders may be subject to 15% Restocking fee.
- All Returns must have an authorization Number (RMA).
- Shipping and service fees are non-refundable.
- No Sales Tax Except in CA. Business hours are 8am to 6pm Mon-Fri.

To Order Call Toll Free
800-931-2001

MACMAN COMPUTER WAREHOUSE
16116 Sherman Way
Van Nuys , CA 91406

International Orders welcome
Bestellen Sie Per Tel/Fax und genießen Sie den Vorteil des tiefen U.S.$$$ Kurses.
Tel:818-901-6250 FAX:818-901-6260

CIRCLE 455 ON READER SERVICE CARD

MACH 10 JET - CPU ACCELERATOR

"Bloody Quick" - Mac Format "Impressive" - MacUser (UK)
"The ideal Solution" - The Mac "A must" - MacUser (UK)

IS AVAILABLE FOR

8100 / 100 (AV)
8100 / 80 (AV)
7100 / 66 (AV)
6100 / 60 (AV)
Q840AV
Q800
Q660AV
C660AV
Q650
C610

- $99 (suggested) to take your 8100/100 to 126MHz!!
- 20-40% acceleration in all CPU tasks
- Reliable, high specification, precision components
- User friendly manual, with many photos
- Full Technical support by qualified engineers
- 30 Day Moneyback guarantee, Lifetime warranty
- Award winning UK design

$99

MacUser

For a free information disk call any of the dealers listed below.
Dealer and Distributor inquiries invited.

Distributor DMS — Tel: 1-800-662-SIMM (7466) Fax: 508-975-5232 Lawrence MA

Dealer MEMORY TRADERS — Tel: 800-315-7807 Fax: 703-522-6626 Arlington VA

Made in The US By: SYZYGY ELECTRONICS — Dealer Inquiries Only Tel: 703 522 6624 ext 213 Fax: 703 522 6626

We Buy Used Memory

256K
512K
1MB
2MB
4MB
8MB
16MB
32MB
64MB
VRAM
IIfx SIMMs
PowerBook Duo

We want your used RAM:

- 30 or 72pin
- Any Configuration
- Any Size
- Any Speed
- SIMMs, SIPPs, & Chips
- Working or Broken
- Any Quantity

Best Prices Paid

BEST PRICES ON ALL SIMMS

We sell:

- 30 or 72pin
- Major Manufacturers Chips
- Lifetime Guarantee
- Free UPS Shipping
- VISA/MC No Fees
- Competitive pricing
- Any Quantity

800-315-7807

MEMORY TRADERS

Come and See us at:
Sun World in San Francisco, May 23-25
PC Expo in New York, June 22-24

Tel: 800-315-7807 Fax: 703-522-6626 Arlington VA

CIRCLE 409 ON READER SERVICE CARD

LOWEST PRICE ON ALL MAC MEMORY

30 PIN SIMMS
1X8-80/70
1X8 FX
2X8-80/70
4X8-80/70
4X8 PAL
4X8-FX
8X8-70
16X8-70

72 PIN SIMMS
1X32-70/60 4MB
2X32-70/60 8MB
4X32-70/60 16MB
8X32-70/60 32MB
Non Composite

FPU
68882-25
68882-33

PMMU CHIPS

ALL PRINTER MEMORY

LIFETIME GUARANTEE
1-800-662-SIMM (7466)

Data Memory Systems
15 Union St.
Lawrence, MA. 01840
Tel. 508-683-2325
Fax. 508-975-5232

University, Government and Corporate P.O.'s with approved credit

NOVUS VISA MasterCard

DRAM
256K DIPS, 1MB DIPS

VRAM
256k VRAM, 512k VRAM 4 & 8 BIT VRAM SETS 1 MB VIDEO ZIPS

POWER BOOK
100:
2MB, 4MB, 6MB

140,145,170
2MB,4MB,6MB

160,165,180
4MB,6MB,8MB, 10MB

165C,180C
4MB,6MB,8MB, 10MB

PB 150 & DUO 210 ,230, 250, 270C
4MB, 8MB,12MB, 14MB, 20MB, 28MB, 36MB

BLACKBIRD 520, 520C, 540, 540C
4MB, 8MB, 16MB, 24MB, 32MB

Memory Upgrade Specialists

CIRCLE 447 ON READER SERVICE CARD

maxed systems™

New / Used / Trades

Performa 630 33/68040 8/500/CD & 14" COLOR MONITOR	$1495
PPC 8100 80 16.700/CD/AV	3395
PPC 7100 80 16/700/CD/AV	3195
PPC 6100 60 8/250	1275
APPLE LASER SELECT 16/600	1945
SELECT 360 600 DPI	1245
PB 520C 8/160	2345
PB 540C 12/320/FAX	3895

CUSTOM ETHERNET CABLING AND CONNECTORS
WE UPGRADE YOUR COMPUTER RAM & HARD DRIVES
Instant Cash for your Memory and Macs!
Call about our DEMO DEALS!
4250 Executive Dr. La Jolla, CA 92037
619.623.1575 • Fax 619.623.1580

CIRCLE 481 ON READER SERVICE CARD

PHONET® Compatible

ONLY $7.99 Mbyte/s

New LCII	$450
LaserWriter Pro 630	$1,599
14" .29 Color Monitor	$199
Powerbooks	Call

CMC Computer Marketing Corporation
1-800-416-6338 CST
615-831-1496
We Buy Macs! • $100,000 available

CIRCLE 412 ON READER SERVICE CARD

ACCELERATE YOUR POWERMAC

Acceleration for your 6100, 7100, Performa 61xx and 8100/100 computer

The DVC Equalizer™ speeds your PowerMac 6100/7100 up to 84MHz and your 8100/100 up to a thundering 126MHz!

Custom connector provides easy slip-on, slip-off acceleration
6100/7100 has selectable speeds from 76MHz-84MHz
8100/100 has selectable speeds from 109MHz-126MHz
Do not be misled. With thousands sold, accept only the DVC Equalizer™!

Add EVEN MORE POWER
PowerMac L2 Cache
256K $129
512K $279

Includes
- DVC Equalizer™ accelerator
- Low noise, high output CPU fan
- Selectable CPU speeds
- Detailed manual
- Bench testing software disk
- Installs in under 5 minutes
- 20-40% speed increase
- No permanent modifications
- Toll-free technical support
- 30-day money-back guarantee
- 1 year warranty
- Only $79.95

Quantity discounts available

800.889.5137

DVC Equalizer 6100/7100 ..... $79.95
DVC Equalizer 8100/100 ..... $79.95
DVC 256K Cache Card $129.00
DVC 512K Cache Card $279.00

DVC

CIRCLE 436 ON READER SERVICE CARD

PERIPHERAL

PERIPHERAL OUTLET, Inc.

800/256-6581

SAVE MONEY!
Peripheral Outlet will buy your old memory at great prices, even if you didn't buy it from us! Call for details.

Call us last! We will try to beat all reasonable competitor's prices!

72 Pin Memory *for the new Macs*

	80ns	70ns	60ns
4 Megabyte			
8 Megabyte			
16 MB-Non Composite			
32 MB-Non Composite			

Prices Changing — Call for Best Prices!

PowerBook 100-series Memory

2 Megabyte upgrade	
4 Megabyte upgrade	
6 Megabyte upgrade	
8 Megabyte upgrade	
10 Megabyte upgrade	

Prices Changing — Call for Best Prices!

PowerBook 500-series Memory

4 Megabyte upgrade	170.00
8 Megabyte upgrade	329.00
16 Megabyte upgrade	649.00
24 Megabyte upgrade	1049.00
32 Megabyte upgrade	1269.00

Duo-series Memory

4 Megabyte upgrade	169.00
8 Megabyte upgrade	329.00
12/14 Megabyte upgrade	479/549
20/28 Megabyte upgrade	795/1095

Cache Cards, Etc.

256K Level 2 Cache Card for PowerMacs	149.00
512K & 1 MB Level 2 Cache for PowerMacs	CALL
128K Cache Card for Quadras	from 125.00
128K Cache Card for LCIII & Performa 450	129.00
IIci/IIsi 64K Cache Card	125.00/159.00
IIsi 2-slot Card and 68882	119.00
Slot-Free Cache Card for LC 475	195.00
Slot-Free Cache for 660AV, 700, 900, 950	245.00

Standard 30 pin SIMMs

1 Megabyte	
2 Megabyte	
4 Megabyte	
8 Megabyte	
16 Megabyte	

Prices Changing — Call for Best Prices!

Video RAM

256K VRAM 80ns	17.00
512K VRAM 80ns	35.00

68882 Math Coprocessors

68882 25 MHz FPU	49.00
68882 33 MHz FPU	59.00
68882 50 MHz FPU	99.00
25 MHz for Macintosh LC/LCII	55.00
20 MHz w/2 slots for Mac IIsi	119.00
25 MHz for Mac Classic II	55.00

Newton Upgrade Products

512K Static RAM Storage Card	99.00
1 Megabyte Static RAM Storage Card	139.00
2 Megabyte Static RAM Storage Card	239.00
2 Megabyte Flash Storage Card	165.00
4 Megabyte Flash Storage Card	259.00
8 Megabyte Flash Storage Card	425.00
16 Megabyte Flash Storage Card	879.00

Miscellaneous

LaserWriter 320 2,4, 6MB upgrades	CALL
LaserWriter Pro 810 4MB/8 MB upgrades	229/399
T.I. MicroLaser 1 MB	49.00
Mac Classic 1 MB Board	75.00
68851 16MHz PMMU	89.00
if requested, MODE 32 software included free w/PMMU	
Mac Portable 3-7 MB Cards	CALL

TOLL FREE TECH SUPPORT
LIFETIME WARRANTY on all memory products
Order by 6:30PM CST for same day shipping*
Overnight delivery from $8.00 *some restrictions apply

68040 50 MHz Accelerator $799

The DiiMOCache '040/50 Accelerator will make your Macintosh as fast as a PowerPC, even in native mode. And you won't have to buy new software. The DiiMOCache '040/50 is a 68040 accelerator boosted to 50MHz with 128K Static RAM Cache. Its Slot-Free design keeps your PDS and NuBus slots free for other cards. Several models support the Quadra 610, 630, 650, 660AV, 700, 800, 900, 950 and Centris 610 and 650. Soon shipping for more 68040 Macs!

68040 Processor w/FPU $279

For the Centris and Quadra 605, 610, 650 and 660AV, and the Performa 475/476 and LC 475.

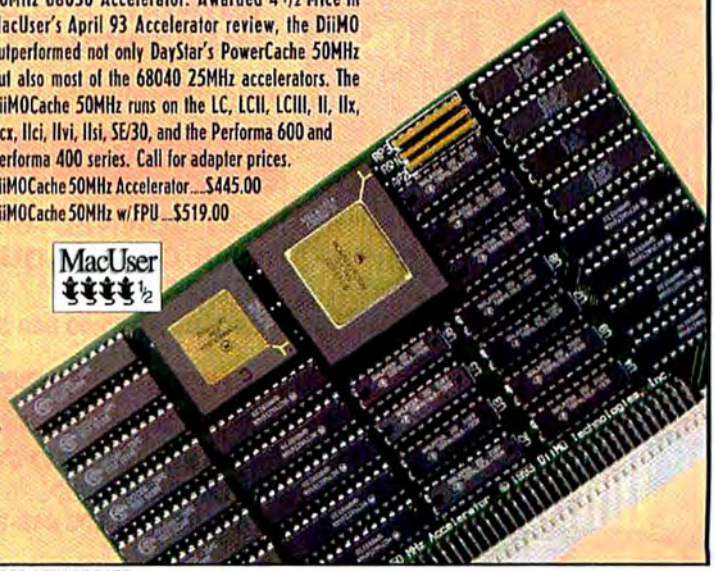
33MHz for Quadra 650 and LC 575	$399.00
40MHz	CALL
Heat Sink	$19.00

50 MHz Accelerator $445

Speed increases of up to 400% with the DiiMOCache 50MHz 68030 Accelerator. Awarded 4 1/2 Mice in MacUser's April 93 Accelerator review, the DiiMO outperformed not only DayStar's PowerCache 50MHz but also most of the 68040 25MHz accelerators. The DiiMOCache 50MHz runs on the LC, LCII, LCIII, II, IIx, IIcx, IIci, IIvi, IIsi, SE/30, and the Performa 600 and Performa 400 series. Call for adapter prices.

DiiMOCache 50MHz Accelerator....$445.00
DiiMOCache 50MHz w/ FPU....$519.00

MacUser ★★★★½



PERIPHERAL OUTLET, Inc.

327 East 14th, PO Box 2329 • Ada, Oklahoma 74820
405/332-6581 FAX 405/436-2245 AppleLink-PERIPHERAL
HOURS: Monday-Thursday 6AM-7PM CST, Friday 6AM-6PM

We accept Visa/MC/Amex/Discover, and COD Cashiers check upon approval. Educational, Government, and Fortune 500 P/Os accepted upon approval.

Due to volatility in the market all prices and availability are subject to change without notice.

CIRCLE 454 ON READER SERVICE CARD

THE LLB COMPANY, INC.

CALL FOR OUR FREE CATALOG
1 800-848-8967

MEMORY

THE MEMORY YOU NEED- AT PRICES YOU WON'T FORGET

CALL US AT 1 800 848-8967

Standard 30 Pin

1x8x80	$37
1x8x100	$35
2x8x80	$79
4x8x80	$135
4x8x80 (IIfx)	$145
4x8x80 (IIfx,IIx)	$139
8x8x70 (IIfx)	$299
16x8x70 (Low Profile)	$609
16x8x70 (IIfx)	$635

72 Pin Memory

PowerPC, Centris, Quadra, LC III

4MB-70ns / 4MB-60ns	$157 / $159
8MB-70ns / 8MB-60ns	$302 / $307
16MB-60ns / 70ns non-composite	$535 / $539
32MB-60ns	$1129

PowerBook Accessories

PB140-170-4/6	$99 / $139
PB160-180-4/6/8/10	$109 / $149 / $219 / $279
PB165C-180C-4/6/8/10	$109 / $149 / $219 / $409
DUO 210 - 280C 4/8/12	$169 / $329 / $479
DUO 210 - 280C 14/20/28	$539 /$795 / $1199
PB 520 - 540C 4/8/16/32	$179 / $319 /$629 / $1229

DRIVES

THE DRIVE TO GET THE JOB DONE - FAST.

Call for the latest in ZIP DRIVES!

Rumi Hard Drives

Rumi 365MB Int / Ext (Quantum)	$229 / $285
Rumi 540MB Int / Ext (Quantum)	$279 / $345

Rumi SyQuest Drives

Rumi 200MB SyQuest w/ FREE Cartridge	$539
Rumi 270MB SyQuest w/ FREE Cartridge	$539

Rumi CD-ROM Drives

Rumi 2x Multisession Photo CD (NEC)	$185

Rumi Optical Drives

Rumi 230 Optical Bundle w/ 5 Verbatim	$839

SCANNERS

HAVEN'T YOU DONE WITHOUT A SCANNER LONG ENOUGH?

We also carry Microtek, Umax and Nikon

AGFA StudioScan II Scanner

400 ppi x 800 ppi includes: Omni Page Direct, Foto Snap, Foto Look, Foto Tune LT and Photoshop LE.
Item# AG Studio II..... $839

Polaroid SprintScan 35 Slide Scanner

Scan 35mm slides up to 2700 dpi - in under a minute! The ideal desktop solution.
Item# PLD619111..... $1999

MODEMS

GET CONNECTED WITH ONE OF OUR QUALITY MODEMS.

CALL US AT 1 800 848-8967

Global Village Platinum

#137365 PowerPort Platinum 28.8 V.34	$339
#137366 TelePort Platinum 28.8 V.34 Ext	$239

Supra

#5014XP Supra Express Plus 14.4	$99
#50V34E-MC Supra 28.8 V.34	$229

US Robotics

#USR 317146 Mac&Fax Sportster V.34	$265

ACCELERATORS

SPEED, SPEED AND MORE SPEED.

CALL US AT 1 800 848-8967

Diimo

DiimoCache 040/50 Accelerators	From $779
DiimoCache Slot-Free Cache Cards	From $175
DiimoCache Quadra Cache Card	From $115
DiimoCache PowerMac Cache	From $155

CIRCLE 563 ON READER SERVICE CARD

All Apple Supplies

HEWLETT® PACKARD Authorized Reseller

media HABITAT

MEDIA

EVERYTHING FROM VERBATIM, SONY, SYQUEST AND TDK.

CALL US AT 1 800 848-8967

SYQUEST	1-4	5-9	10+
44MB 5.25"	$42	$41	$40
88MB 5.25"	$48	$47	$46
200MB 5.25"	$76		$75
270MB 3.5"	$59	$58	$57
105MB 3.5"	$55		$54

Sony

230MB Optical $39
CD-ROM 74 Min 4x $11.99
HI-8 120 Metal Evaporated $14
All Audio & Video Products

Verbatim

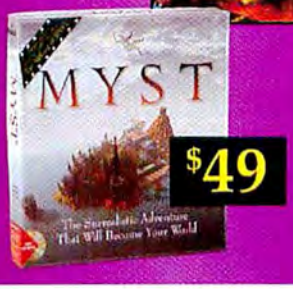
3.5" Optical 128MB $24
5.25" Optical 1.3GB $79
CDR 74 Mn 4x $10
CDR 74 Mn 4x (10 pack) $89

TDK

4mm DAT 60/90 meter ..... $5.99/$6.99
4mm DAT 120 meter $18
TDK VHS-C 30 min EH $3.99

CD-ROM HABITAT

$49



CD-ROM

ALL THE LATEST CD-ROM TITLES FROM GAMES TO EDUCATION.

CALL US AT 1 800 848-8967

Entertainment

Doom II $49
Myst $49
Gadget $46

Education

Broderbund ..... Call
The Learning Company ..... Call
Davidson ..... Call

Special Interest

Compton's ..... Call
National Geographic ..... Call

Graphics

Corel corporation ..... Call
Photodisc ..... Call
Seattle Support Group ..... Call
T / Maker ..... Call

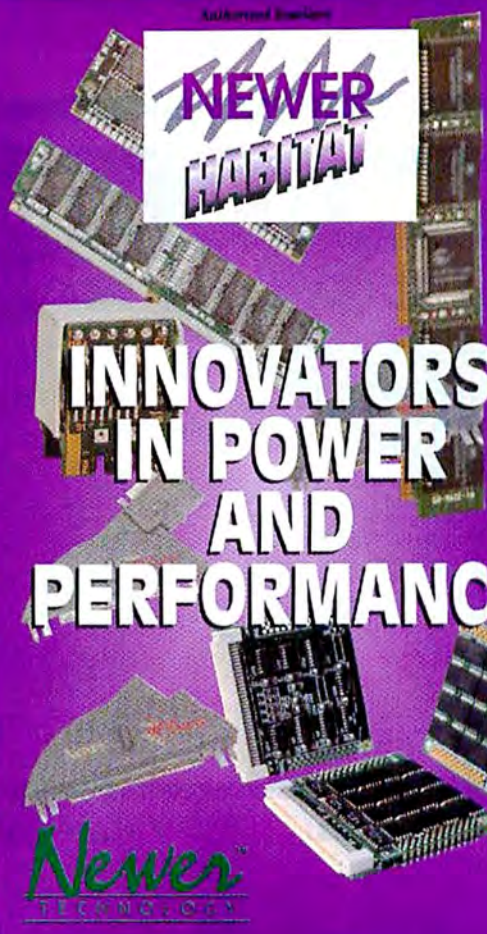
- Airborne Express Overnight $6 and up
- Fax Your Order To: 206-746-5168

Electronic orders: Compuserve @ 73423, 1272
For International Call: 206-746-0229

- First quality brand new products
- P.O.'s accepted upon approval
- All major credit cards accepted– No surcharge– when shipped
- Prices subject to change– Not responsible for errors
- We export to most countries in the world
- Orders received before 8:00 pm EST weekdays shipped same day
- All returns require approval and are subject to a restocking fee
- Open 6 am to 7 pm M-F. 9 am to 4 pm Saturdays
- No sales tax except applicable sales tax in WA
- **Returns subject to a 15% restocking fee.**

The LLB Company, Inc. 13228 NE 20th St., Suite B, Bellevue, WA 98005

NEWER HABITAT



INNOVATORS IN POWER AND PERFORMANCE

Newer TECHNOLOGY

Macintosh SIMMs
for all models of Mac and Power Mac.

Power MacCache
256K Power Mac Cache Memory.

SCSI MicroDock
PowerBook Duo Mini Docking Bar.

Meteor+ Accelerator
50MHz 68040 accelerator with 128K Cache.

PowerBook Memory
2MB to 32MB Memory Modules.

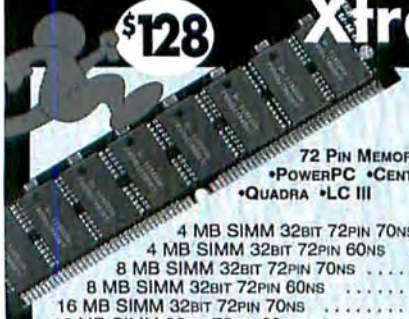
Mac Clip & Power Clip
CPU accelerator for Centris, Quadra and Power Mac.

FOR ALL YOUR QUALITY NEWER TECHNOLOGY PRODUCTS CALL THE NEWER HABITAT

1 800-840-2212

Macworld SHOPPER®

MAC Xtra. . . Xtra Memory, Xtra Media, Xtra Savings, Xtra Value!



72 Pin Memory •PowerPC •Centris •Quadra •LC III

4 MB SIMM 32bit 72pin 70ns	$155
4 MB SIMM 32bit 72pin 60ns	$159
8 MB SIMM 32bit 72pin 70ns	$302
8 MB SIMM 32bit 72pin 60ns	$307
16 MB SIMM 32bit 72pin 70ns	$535
16 MB SIMM 32bit 72pin 60ns	$539
32 MB SIMM 32bit 72pin 60ns	$1129
128 MB (Kit of 2-64MB SIMMS)	$4659

30 Pin Memory

1x8x70	$38
1x8x80	$36
1x8x100	$28
2x8x70	$80
2x8x80	$78
4x8x70	$137

Macintosh Memory

4x8x80	$135
8x8x80	$317
16x8x70 (low profile)	$589

Additional Memory

1x8x80 (IIfx & NTX)	$36
1x8x70 (IIfx)	$38
4x8x80 (II, IIx) PAL	$138
4x8x70 (II, IIx) PAL	$140
4x8x80 (IIfx)	$136
4x8x70 (IIfx)	$138
8x8x70 (IIfx)	$315
16x8x70 (IIfx)	$560
1x9x70 (IBM)	$41
4x9x70 (IBM)	$152
1x36 - 4 MB	$179
2x36 - 8 MB	$345
8x36 - 32MB	$1339

PowerBook Memory

4 MB Upgrade– PB100	$167
6 MB Upgrade– PB100	$175
4 MB Upgrade– PB140/145/145B/17	$94
6 MB Upgrade– PB140/145/170	$135
4 MB Upgrade– PB160/165/180	$95
6 MB Upgrade– PB160/165/180	$148
8 MB Upgrade– PB160/165/180	$215
10 MB Upgrade– PB160/165/180	$275
4 MB Upgrade– PB165C/180C	$145
6 MB Upgrade– PB165C/180C	$165
8 MB Upgrade– PB165C/180C	$215
10 MB Upgrade– PB165C/180C	$405

PowerBook DUO 210-280C

4MB Upgrade	$165
8MB Upgrade	$325
12MB Upgrade	$475
14MB Upgrade	$559
20MB Upgrade	$792
28MB Upgrade	$1,197

PowerBook 150 Series

4 MB RAM Module	$179
8 MB RAM Module.	$342
14 MB RAM Module	$587

PowerBook 500 Series

4 MB RAM Module	$170
8 MB RAM Module.	$315
16 MB RAM Module	$627
32 MB RAM Module	$1,229

Accessories

Math CoProcessors

LC & LCII 16mhz	$49
LCIII 25mhz	$48
LC575 33mhz 040	$350
Classic II 16mhz	$55
Color Classic 16mhz	$48
Duo/P600 33mhz	$59
Centris 25mhz CPU replacement	$299

Video Ram

Video Ram 256K	$20
Video Ram 512K	$38

Cache for PowerMacs 6100, 7100

256K Cache	$185
512K Cache	$445
1MB Cache	$859

Media

SyQuest Cartridge 44MB	$42
SyQuest Cartridge 88MB	$48
SyQuest Cartridge 105MB	$55
SyQuest Cartridge 200MB	$76
SyQuest Cartridge 270MB	$59
Sony 3.5" Floppy Disks 2SHD	$6.90
Verbatim 128MB MO cartridge	$28
Verbatim 230MB MO Cartridge	$35
Verbatim 600MB MO Cartridge	$69
Verbatim 1.3GB MO Cartridge	$82
Verbatim CD-R 74 Min. 650MB	$13.99
Iomega Zip100 Media Cartridge	$19
Bernoulli 230MB Single Cartridge	$96
Bernoulli 230MB 5-pk Cartridge	$455

Video Cards

Radius

Thunder IV GX-1152	$2069
Thunder IV GX-1360	$2485
Thunder IV GX-1600	$3062
Thunder 24GT	$1449
PhotoEngine DSP Upgrade	$829
PrecisionColor Pro 24XP Nubus	$461
PrecisionColor Pro 24XK Nubus	$768
PrecisionColor Pro 24X Nubus	$1159
SpigotPower AV	$829
Spigot II Tape	$705
Video Vision Studio 2.0 Nubus	$4099

RasterOps

Paintboard Prism	$729
Paintboard Prism GT	$1025

Special Xtras

Paper Port printer	$365
Wacom ArtZ Graphic Tablet	$299
Wacom 4X5 ArtPad ADB Tablet	$145

Printers, Scanners, Networking etc..pls call

Accelerators

Daystar

Turbo 040 40 Mhz	$795
Turbo 040i 33Mhz	$609
Turbo 601for IIci	$999
Powercard 601	$649
PowerPro 601 80Mhz w/RAM Expansion	$1845
PowerPro 601 100Mhz	$1749

Drives

FREE CARTRIDGE ! (WITH RUMI SYQUEST DRIVES)

88MB SyQuest drive w/cartridge	$379
105MB SyQuest drive w/cartridge	$379
200MB SyQuest drive w/cartridge	$529
270MB SyQuest drive w/cartridge	$529
Rumi CD-ROM Drive 2X	$185
Rumi 230MB Magneto Optical Drive	$679

Rumi Quantum Drives

Rumi 160MB Int/Ext	$189/$255
Rumi 365MB Int/Ext	$229/$285
Rumi 540MB Int/Ext	$279/$345
Rumi 730MB Int/Ext	$345/$405
Rumi 1GB Int/Ext	$645/$705
Rumi 2.1GB Int/Ext	$1065/1145
IOMEGA Zip100 External Drive	$209
Bernoulli Transportable 230 Drive	$459

PowerBook Accessories

Battery for PB140/180	$49
Battery for PB100	$49
Charger for PB140/180	$89
Mini A/C Adapter for PB140/180	$50
Mini A/C Adapter for PBDuo	$50
Slimpack for PB100/180C	$145
Slimpack for PBDuo	$235
Powerbook Carrying Case	$32
Kensington Turbo Mouse	$106
Kensington Thinking Mouse	$99
Kensington Keyboard Mac 101E	$89

Modems

Global Village

Teleport Bronze	$97
Teleport Gold II	$133
Teleport Platinum 28.8	$239
Powerport Platinum28.8	$339
Powerport Mercury PB500Series	$329
Powerport Duo	$329

Supra

Supra 2400 Baud modem	$59
Supra Express Plus 14.4	$99
Supra 28.8 V.34 S/R	$229
Supra Powerbook 14.4 S/R Fax	$165
Supra Powerbook 28.8 S/R Fax	$319

US Robotics

Mac & Fax Sportster 14.4	$152
Mac & Fax Sportster V.34	$265

Overnight Delivery $7 and up
Fax Your Order 24 Hours A Day! (206) 746-5324
MasterCard, VISA & Discover , No Surcharge
Prices Subject to Change Without Notice.
Phone (206) 746-3803

UPS Ground $6 and up
Returns Subject to Approval and 15% Restocking Fee
Office Hours:
M-F, 7:00 AM to 6:00 PM
Sat, 9:00 AM to 4:00 PM PST

MAC Xtra 1075 Bellevue Way NE, Suite 114, Bellevue, WA 98004

1-800-553-4230

CIRCLE 561 ON READER SERVICE CARD

ACCELERATORS/FPUs

DOUBLE THE SPEED OF YOUR CENTIS OR QUADRA!

	No FPU/FPU
40MHz 68040 **Centris 610**	$249/$399
50MHz 68040 **Quadra 650/660av**	
Quadra 610,660av,700,900	$599
40MHz 040 **IIci,IIsi*,IIx*,IIcx***	$599
33MHz 030 w/Video **Mac SE**	$249/$299
25MHz 020/FPU **LC**	$99
33MHz 030/FPU **LCII, P400-430**	$149
33MHz 030 **Mac II, IIx**	$189/$239
256K Cache Card **PowerMac**	$129
128K Cache **Quadra700,800,9X0**	$199
80 MHz PowerBooster **6100/7100**	$79
68040-25 FPU **Q605,610, LC475**	$149*
68040-33 FPU **Q,LC,P575/630** (*with 68LC040 trade-in)	$249*
68882 FPU **LC I-III, Duo, etc.**	$49
68851 PMMU w/Mode32 **Mac II**	$99

CONNECT TECHNOLOGIES
Irvine California Since 1986
714-261-2800 Fax 714-261-2461
800-786-6260
No Surcharge — Gov't./Corp./Educ. P.O. One year warranty! — No Surcharge

CIRCLE 463 ON READER SERVICE CARD

Dynamic Engineering

PowerBook & Duo Accelerator

Portable Products
Memory, HDD, Battery
POWERBOOK 500 BATTERIES
435 Park Dr., Ben Lomond, Ca. 95005
Fax 408-336-3840
DSCVR VISA/MC P.O.
(408) 336-8891

CIRCLE 411 ON READER SERVICE CARD

WANTED: USED SIMMS

TOP $$$ PAID
256K-32MB
We Buy Macs
Mac Solutions
(310) 394-0001
FAX (310) 394-7744
1416 Wilshire Bl. Santa Monica, CA 90403

CIRCLE 410 ON READER SERVICE CARD

YOU WON'T WASTE MEMORY WITH SIMMSAVER

SimmSaver® PATENT PENDING

- SimmSaver/30® converts four 30-pin SIMMs into a single 30-pin SIMM
- SimmSaver/8® converts your 30-pin SIMMs into a 72-pin SIMM
- SimmSaver/8®® converts eight 30-pin SIMMs into a single 72-pin SIMM
- SimmSaver/32® converts your 72-pin SIMM socket into two 72-pin SIMM sockets
- We sell new memory /buy used memory

1-800-636-7281
SimmSaver® Technology, Inc.
228 N. Pennsylvania • Wichita, KS 67214

CIRCLE 402 ON READER SERVICE CARD

MEMORY

GUARANTEED LOWEST PRICES
Memory for Desktops, Laptops, Laser Printers from Apple to Zenith
WE BUY EXCESS MEMORY
1-800-808-6242
ERITECH INTERNATIONAL
818/244-6242 FAX 818/502-5059
740 N. Glendale Ave., Glendale, CA 91206

CIRCLE 469 ON READER SERVICE CARD

MEMORY

MAC 72 PIN

1X32 60/70	$147/141
2X32 60/70	$295/288
4X32 60/70	$539/531
8X32 60/70	$1090/1040

POWER PC

4M/8M	$145/290
16M/32M/64M	$474/977/2044

PC 72 PIN

4X36 60/70	$569/545
8X36 60/70	$1465/1443

POWER BOOK 520, 520C, 540, 540C

4M/8M	$168/321
16M/32M	$628/1295

140,145,170	4M/6M $93/140
150,165,180	4M/8M $94/Call
165C, 180C	4M/6/8 $100/178/217

DUO

210/230/...../280/280C	
4M/8/12	$169/328/479
14M/20/28	$557/799/1212

VIDEO VRAM

256K/512K	$21/37

Printer and PCMCIA Memorys available
H.B.R. ENTERPRISES
11666 SANTA MONICA BLVD #201, W.L.A. CA 90025
TEL (800)HBR-2021
FAX (310)826-2573
7:30 AM 6:00 PM MON-FRI
10:00 AM 3:00 PM SAT
Prices subject to change. Limited availability. Return items subject to approval and restocking fee.

CIRCLE 452 ON READER SERVICE CARD

Mac UPGRADES!

MEMORY Mac		MEMORY PowerMac	
1MB 8-70NS	$35	72 PIN (NEW!)	
2MB 8-70NS	$78	4MB (70/80NS)	CALL
4MB 8-70NS	$134	8MB (70/80NS)	CALL
8MB 8-70NS	$267	16MB (70NS/80NS)	CALL
16MB 8-70NS	$529	32MB (70NS/80NS)	CALL

VIDEO MEMORY
256K VRAM $22
512K VRAM $38

!! SYQUEST !! SALE !!
SyQuest Tape Drive
SyQuest 88C Int. $249

HARD DRIVES For MAC & POWERBOOK
Quantum LIGHTNING — Quantum DAYTONA
365MB $195 1080GIG $575 256MB $75
540MB $245 1440GIG $725 514MB $185
Mini External Drive Housing w/cables - $79

MICRO EXCHANGE
2101 Wayne Street, (P) Hollywood, CA 90027
• Extensive Memory Warranty
• Full Line of Mac & PC wares
• Call for a Complete Catalog
• Prices Subject to Change
800-610-6227 (714) 374-2559 (FAX) 374-2588

CIRCLE 421 ON READER SERVICE CARD

Memory Wanted

WE BUY NEW OR USED
SIMMS
256K, 512K, 1MB, 2MB, 4MB, 8MB, 16MB, 32MB.
30 Pin, 64 Pin or 72 Pin.
POWERBOOK 2MB - 28MB

We Buy In Quantity. Call Us or Send Fax
INNOVATIVE MICRO PRODUCTS, INC.
7645 Leesburg Pike, Suite 201
Falls Church, Virginia 22043
Tel.: 703-848-0711 Fax: 703-848-0712

CIRCLE 462 ON READER SERVICE CARD

Make your computer both a Macintosh and a UNIX workstation.

The Mach™ operating system combines the high-level functionality of a networked UNIX workstation with Macintosh's wide array of applications

Mach™ is Berkeley BSD UNIX that runs on the Classic to the Power Macintosh! So in addition to the easy-to-use applications that make Macintosh the most personable computer around, you get a MACH-based UNIX with pre-emptive mutitasking.

The Macintosh/UNIX integration is so strong that you can even use Mac programs and utilities on UNIX data, and UNIX programs and utilities on Mac files.

Mach™'s full internet protocol support ensures fast, easy client and server NFS, electronic mail, and file transfer with all TCP-based entities on your network.

The UNIX development system includes the GNU C and C++ compilers and libraries for creating new applications or port existing ones. The Motif toolkit and suite of X clients and libraries make developing distributed applications a breeze.

And Tenon's high performance X Server lets you use your Macintosh or Power Macintosh as an X terminal.

For more information, or to order
Call 1-800-6-MACH-10
internet: info@tenon.com
http: //www.tenon.com

TENON INTERSYSTEMS
1123 Chapala Street, Santa Barbara, CA 93101
Tel: 805-963-6983, Fax: 805-962-8202
©1994 Tenon Intersystems. All trademarks are the property of their respective owners.

CIRCLE 468 ON READER SERVICE CARD

TeleFinder BBS

Create Your Own GUI On-Line Service!

- Easy-to-use Electronic Mail
- Gateways to the Internet and Fidonet
- Fast ZMODEM File Transfers
- View GIF and PICT graphics online
- Conferences and Message Forums
- Multi-User Chat and Instant Messages
- File Search and Thumbnail Previews
- New TFNet and UUCP support
- Client software for Mac and Windows

Spider Island Software • 4790 Irvine Blvd #105-347 Irvine, CA 92720
Voice (714) 669-9260 • FAX (714) 669-1383 • BBS (714) 730-5785

CIRCLE 597 ON READER SERVICE CARD

ATTENTION: Students, Teachers & Schools!!

#1 In Education!

QUARKXPRESS 3.3.1 $299

ARCHICADD 4.55 $495

DIRECTOR 4.04 $589

FREEHAND 5.0 $195

AUTOCAD 12 $199

STRATA STUDIO PRO 1.5.1 - $495

4TH DIMENSION 3.2	$475	LOTUS 1-2-3 V1.1	$99
ALCHEMY 3.0 MAC	$85	MAC ACADEMY VIDEOS	$39
AMERICAN HERITAGE DLX	$65	MAC DRAFT 4.1	$199
ARRANGE 2.01	$149	MACROMODEL 1.5.2	$429
ASTOUND 1.5	$129	MAC WRITE PRO 1.5	$85
AUTHORWARE PRO 3.0	$975	MATHEMATICA 2.2.2	$175
BLUEPRINT 5	$149	MINICAD +5.02	$319
CANVAS 3.5.2	$175	M.Y.O.B. 5.0 WITH PAYROLL	$90
CLARIS WORKS 3.0	$89	M.Y.O.B. 5.0 W/OUT PAY	$49
CODA FINALE 3.2	$249	NISUS WRITER 4.0	$149
CODE WARRIOR GOLD 5	$149	NOW BUNDLE 3.0	$75
COLLAGE 2.01	$175	NOW UTILITIES 5.0	$59
CS CHEM OFFICE PRO 2.0	$299	PAINT ALCHEMY 2.0	$85
DATADESK 4.2	$329	RAM DOUBLER 1.5	$55
DELTAGRAPH PRO 3.5	$95	RAY DREAM DESIGNER 3.0	$179
DESIGN WORKSHOP 1.2	$249	SHOWPLACE 2.2 CD-ROM	$149
DIRECTOR MULT. STUDIO	$1175	SKETCH 2.0	$249
DIRECTOR, SOUND EDIT 16 & CLIPMEDIA II	$695	SMALLTALK 5 V2.0	$99
ENCORE 3.0.7	$249	SOFT WINDOWS 1.0	$229
FAST TRACK SCHEDULE	CALL	SOUND EDIT 16	$199
FINAL DRAFT 3.0	$125	SPANISH POWER TRANSL.	$99
FONTOGRAPHER 4.1	$175	STRATA VISION 3-D 4.0	$249
FORM Z 2.62	CALL	SUPERCARD 2.0	$149
FRACTAL DESIGN POSER	CALL	SUPERCARD 2.0 BUNDLE	$249
FRACTAL PAINTER 3.0	$219	TERAZZO	$95
FRAMEMAKER 4.04	$399	TEXTURESCAPE 1.5	$85
FULL CONTACT	$79	TOP DOWN FLOWCHARTER	$149
IN-CONTROL/QUICKEN 5	$85	TYPESTRY 2.1.1	$135
INFINI-D 2.6	$249	UP-FRONT 3-D 2.0	$125
INSPIRATION 4.1	$89	VELLUM 3-D 2.6	$595
JMP VERSION 3.1	$329	VIDEO FUSION 1.6.1	$275
KAI'S POWER TOOLS 2.1	$85	VIREX 5.5	$60
KPT BRYCE 1.0	$85	WALKTHROUGH PRO 2.0	$249
KPT CONVOLVER	$85	WACOM ART PAD 4X5	$139
LOGOMOTION 1.5	$75	WACOM ARTZ 6X8	$285
		WORD PERFECT 3.1	CALL

LATEST VERSIONS & FULL PACKAGES

**SAME DAY SHIPPING ON MOST ITEMS.
**ADOBE, SYMANTEC & MICROSOFT PRODUCTS AVAILABLE TO QUALIFIED STUDENTS, TEACHERS & SCHOOLS.
**SCHOOL PURCHASE ORDERS WELCOME.
**NO SURCHARGE ON CREDIT CARDS.
**IBM & MAC PRODUCTS AVAILABLE.

CALL FOR FREE CATALOG!!

WE WILL BEAT ANY ADVERTISED PRICE!!

The SOFTWARE Source

1-800-289-3275

DISCOVER VISA MasterCard

2517 Hwy 35, Bldg L
Manasquan, NJ 08736
(908) 528-0030
FAX (908) 528-9378
EMAIL: SFTSWS@AOL.COM

CIRCLE 570 ON READER SERVICE CARD

CIRCLE 538 ON READER SERVICE CARD

MAC Grade $85.00

Take the work out of GRADING!

Save time and energy with MacGrade, the powerful grade manager that's fast, fun and exceptionally easy to use. Great reports and graphs. **New!** Version 2.2 has separate elementary and secondary/college editions.

Call (800) 795-0641

CalEd Software
P.O. Box 22913, Carmel, CA 93922
60 Day Unconditional Money Back Guarantee.

CIRCLE 406 ON READER SERVICE CARD

Astrology SOFTWARE

Software for professionals and students. Chart Interpreters, Atlases, Star Clocks and more. Superior accuracy, high resolution output. Call for a FREE catalog! PowerPC Native & Color

(800) 827-2240

Time Cycles Research
375 Willetts Ave. Waterford CT 06385
(203) 444-6641 Fax (203) 442-0625

CIRCLE 407 ON READER SERVICE CARD

LXR•TEST BEST IN TESTING

Highest-rated software for every testing environment: classroom, school, district, governmental, industrial and certification.

- ✓Item Banking & Test Production
- ✓Test Scoring w/Group Comparison
- ✓Mastery Reporting & Remediation
- ✓Survey Scoring and Analysis
- ✓Interactive Testing with Movies
- ✓Weighted & Multi-Response Grading
- ✓Accomodates All Question Types
- ✓Integrated Design (Mac & Windows)

Logic eXtension Resources
909•980•0046 Fax: 987•8706
7168 Archibald Ave. Suite 240
Rancho Cucamonga, CA 91701

Practica Musica™ VERSION 3

Your personal music tutor now includes rhythm tapping, chord progressions, and many other exciting new features. More than ever the most complete music training package available for both beginners and advanced students. $140

NEW!

ARS NOVA • (206) 828-2711 • (800) 445-4866
FAX (206) 889-0359 or (206) 828-2132

Songworks™

Not only prints your song, but helps you write it! Suggests tune and harmony ideas, plays, prints melody, chord symbols, lyrics with or without MIDI. $125

CIRCLE 595 ON READER SERVICE CARD

BIBLE MASTER™ NAS COMPUTER BIBLE

Get them all together...

King James Version | New International Version | New American Standard Bible

...add on modules
NAS Hebrew/Greek Dictionaries
NAS Topical Studies
and more!

American Bible Sales
870 S. Anaheim Blvd., Anaheim, CA 92805
DISCOUNT SOFTWARE PRICES
1-800-535-5131

CIRCLE 537 ON READER SERVICE CARD

SOFTWARE FOR THE CHURCH

Management Programs: Written in 4th Dimension **Roll Call** for churches—Macworld*** review Aug. '93, **Honor Roll** for non-profit ministries. Full function demos with guide $10. **Online Bible** — "The standard by which all other...are judged" *(Kay Hall, CMUG-LA May '94)*. Basic pkg: KJV/NIV, Strong's, X-refs, Lexicons. Many a-la-carte items available. Written in C, Fast, easy. 10 mgs. $75

BY THE NUMBERS, INC.
RR 1 Box 75, Sutton NH 03221
800-554-9116 or 603-927-4508

Family Heritage File™ Genealogy. New Version 3.3! Most powerful and easy genealogy program on Mac. Rated "BEST" by Macworld. Designed by genealogy professionals. • Stand alone • Graphic Pedigree, Descendants, Family Group, Individual, Marriage, Surname • Unlimited History • Sorted Lists • Export to WP/data base/ modem • GEDCOM compatible • Jewish/LDS features. $149 + 5 s/h. Ask about Family Heritage Bundle. Visa/MC. Demo $7. Free Lit Pak.

Star•Com Microsystems
Windsor Park East
25 West 1480 N., Orem, UT 84057
801/225-1480

EDUCATIONAL & RECREATIONAL MULTIMEDIA & CD ROM GRAPHICS

Macworld SHOPPER

HYPERCHINA

INTERACTIVE CHINESE !

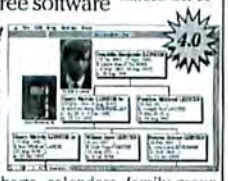
漢

- Full one-year course
- Speak, read & write
- 20MB of sounds
- 2000 words & phrases
- Fun games & drills
- Animated calligraphy
- Only $195

SinoLogic Software
P.O.Box 5242
Berkeley, CA 94705
1-800-869-9654
510-420-0634
dajuin@netcom.com

CIRCLE 408 ON READER SERVICE CARD

REUNION® ★★★★½
the family tree software *MacUser* Oct '90



New Version! Reunion quickly organizes your family information, displays pictures, shows relationships, creates large graphic tree charts, calendars, family group sheets, mailing lists, cascading pedigree charts, book-style family histories, and more. To order, call 800-334-4444. For a free brochure, contact:

Leister Productions
P.O. Box 289, Mechanicsburg, PA 17055
Phone 717-697-1373 — *Fax* 717-697-4373
CompuServe 74774,1626 — *AOL* LeisterPro

Bible Book Store On Disk
Full Featured, Fast and Friendly Bible Study software. As the leader in Bible Study software since 1981 we have continued to listen to our customers and provide them with the tools they need. We offer the most comprehensive line of Bible study tools available.
Call for FREE catalog.
Bible Research Systems
2013 Wells Branch Pkwy #304
Austin, TX 78728
800/423-1228
512/251-7541

Quality Educational Software

- Top software publishers for schools
- Apple II and Mac Software
- All software evaluated by computer educators

Home Educational Software
5252 Villa Mallorca
Camarillo, CA 93012
Tues-Fri 9:30-6:30 P.M. PDT
California Dial 805 388 2722
or Dial 800 622 0879

POSTERS MURALS BILLBOARDS BACKDROPS TRADESHOW EXHIBITS BANNERS
PRESENTATIONS POINT-of-PURCHASE DISPLAYS

THE ONLY FAST, EASY, ECONOMICAL WAY TO CREATE LARGE-FORMAT PRINT JOBS.

- Layouts up to 10,000 square feet
- Imports EPS, TIFF, Scitex CT artwork
- Drives any PostScript printer
- Fixed, custom and automatic tile sizes
- Variable panels, margins, gaps, overlaps, bleeds
- Hundreds of professional large-format production tools
- Supported by a network of service bureaus nationwide

For info call: (617) 338-2222 or fax: (617) 338-2223
Now at MacWarehouse! 1-800-255-6227

1990 MacUser Editors' Choice NOMINEE
"★★★★" Macworld 8/93 MacWEEK 2/93

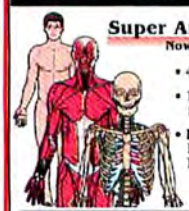
©1994 S. H. Prince & Co. Ste. 323 Bldg. 600, One Kendall Sq., Cambridge, MA 02139

PosterWorks

CIRCLE 594 ON READER SERVICE CARD

Super Anatomy Collections
"...technically and artistically superior."

LifeART™ Professional Medical Clip Art CD-ROM



Super Anatomy 1,2,3
Now Shipping!

- 400 New Images
- 100% Compatible in all Mac Software
- Editable in Illustrator and MacDraw Pro!

TechPool Studios
Cleveland, Ohio
Tel: 216-291-1322
Fax: 216-382-1915

FREE Catalog 800-LifeART 543-3278
★★★★★ *Medical Software Reviews

CIRCLE 415 ON READER SERVICE CARD

U.S. Digital Topography CD-ROM

- Color shaded relief maps
- Individual state maps
- State detail at 1:530,000
- Editable in applications which read PICT graphics

Eastern U.S. $99
Western U.S. $99
Chalk Butte Digital Maps
Visa 307-537-5261 MC

CIRCLE 419 ON READER SERVICE CARD

THE VIRTUAL STUDIO COMPANY™ STRATA

Strata Products Also Available Through :

MacPlace
The Mac Zone
MacWAREHOUSE

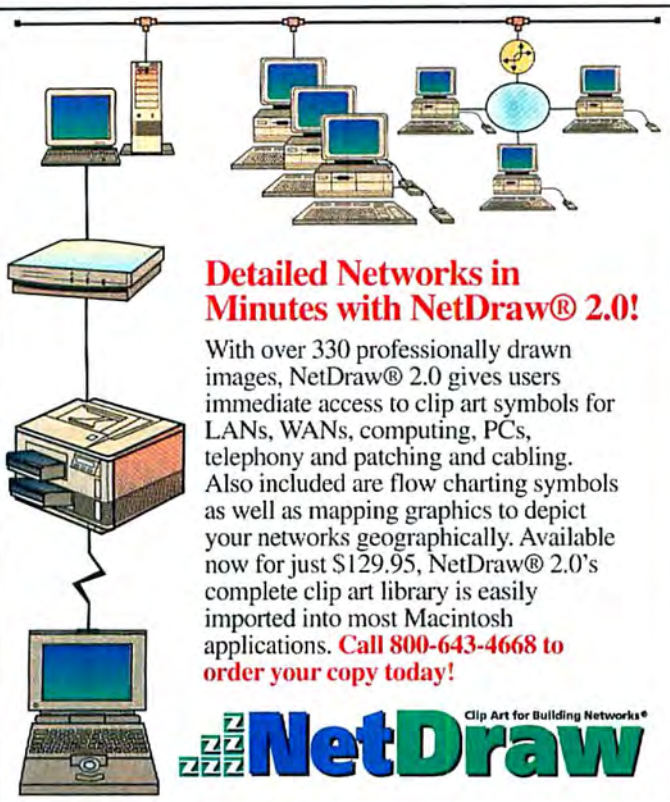
Vision3d 4.0
competitive upgrade $149

STRATA VIRTUAL 3d · STRATA CLIP 3d · FRACTAL TERRAIN · RENDERPRO 3

For best pricing on
Strata Extensions

call: 1-800-STRATAFX

CIRCLE 484 ON READER SERVICE CARD



Detailed Networks in Minutes with NetDraw® 2.0!

With over 330 professionally drawn images, NetDraw® 2.0 gives users immediate access to clip art symbols for LANs, WANs, computing, PCs, telephony and patching and cabling. Also included are flow charting symbols as well as mapping graphics to depict your networks geographically. Available now for just $129.95, NetDraw® 2.0's complete clip art library is easily imported into most Macintosh applications. **Call 800-643-4668 to order your copy today!**

Clip Art for Building Networks®

NetDraw

CIRCLE 461 ON READER SERVICE CARD

Create PostScript files in one-tenth the time!

The last time you created a PostScript® file, you may have had the gnawing suspicion that there was a quicker, easier way to accomplish this time-consuming procedure. You were right!

Finally, there is a utility which can reduce the usual time it takes to make a PostScript file by up to 90 percent: PSExpress. PSExpress produces startling results with QuarkXPress, Freehand, Illustrator and Photoshop.

Here's what a pre-press professional says about PSExpress:

"In our operation, we create quite a few high-resolution PostScript files for national magazine and catalog pages. PSExpress has reduced the time to create each file by an amazing 80-85%. If I hadn't seen it, I would not have believed it. I only wish every software package could live up to the promises they make like yours has. Thanks for making our jobs easier."

ELECTRONIC PRE-PRESS SUPERVISOR, WORLD COLOR PRESS

You've wasted enough time and money creating PostScript files the old-fashioned way. It's time to speed up the process!

30 DAY MONEY BACK GUARANTEE

Productive Intelligence

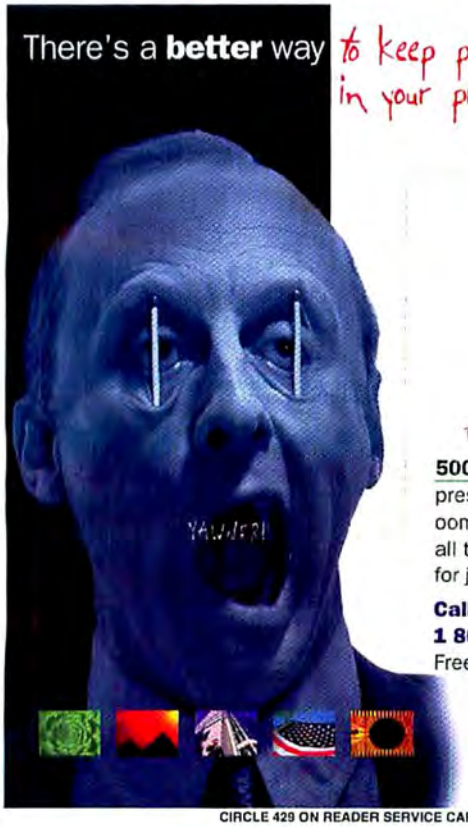
5430 Pine Cone Road
La Crescenta, CA 91214
818-541-0231 FAX: 818-541-1815

CALL NOW! 800-500-0541

Only $249.00

PSExpress is a trademark of Fabula, Ltd. Product names are trademarks or registered trademarks of their respective companies and are hereby acknowledged. ©1994 by Productive Intelligence, Inc. All Rights Reserved.

CIRCLE 460 ON READER SERVICE CARD

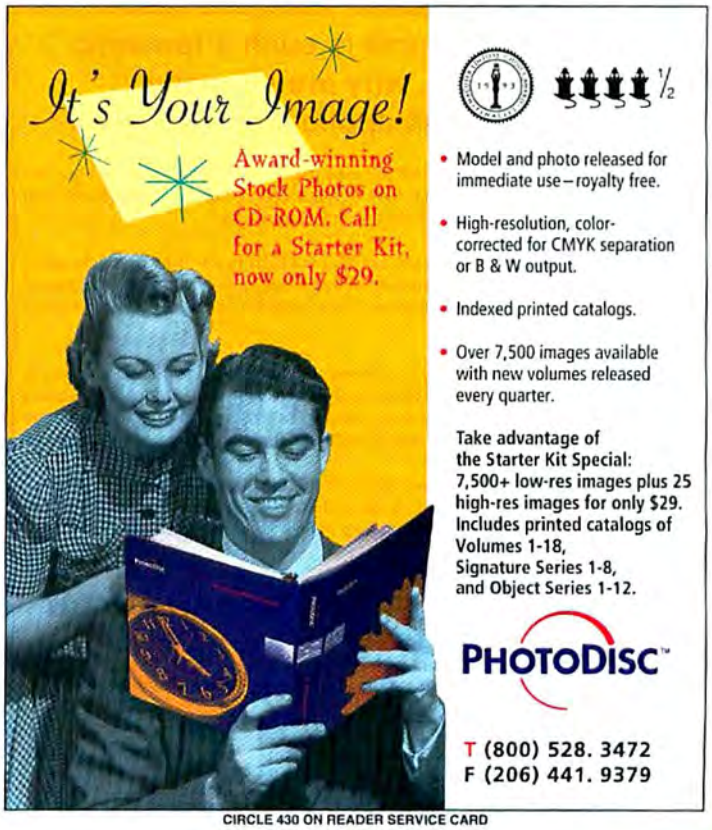


500 photos to give your presentations more oomph! Open your eyes to all the possibilities for just **$79.**

Call to order:
1 800 528.3472
Free catalog.

CLIPPIX™
FROM PHOTODISC™

CIRCLE 429 ON READER SERVICE CARD



- Model and photo released for immediate use—royalty free.
- High-resolution, color-corrected for CMYK separation or B & W output.
- Indexed printed catalogs.
- Over 7,500 images available with new volumes released every quarter.

Take advantage of the Starter Kit Special: 7,500+ low-res images plus 25 high-res images for only $29. Includes printed catalogs of Volumes 1-18, Signature Series 1-8, and Object Series 1-12.

PHOTODISC™

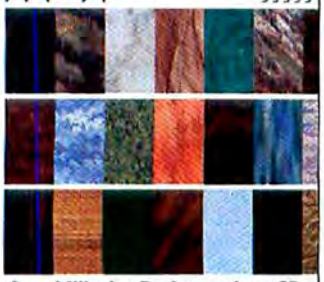
T (800) 528. 3472
F (206) 441. 9379

CIRCLE 430 ON READER SERVICE CARD

GRAPHICS PROGRAMMING & UTILITIES SERVICES & SUPPLIES

Macworld SHOPPER®

ARTBEATS



Award-Winning Backgrounds on CD

800-444-9392 or 503-863-4429

Artbeats, Box 709, M.C. OR 97457, Fax: 503-863-4547

6000 Images

World's Largest Library of Classic Art on a Single CD

Rare Lithographs
Mythology - Great Masters - Madonnas
Unique Woodcuts
Coats of Arms
Ancient Engravings
Angels - Bookplates

Brochure 800 335-2513

Ask for CDA / 6000

Galactic Sun Pro. Lumin@aol.com.

Order 800 247-6553 $59

CIRCLE 477 ON READER SERVICE CARD

New Instant Logos

More than 1,000 logo designs — **ready to use** in EPS format. Eight different graphic categories. Available on Floppy or CM-ROM. **$69.** (Call for free brochure.)

Logo Design Software

Logo SuperPower® lets you create world class designs like these in minutes. Available for Mac or PC on Floppy or CD-ROM. Requires drawing program such as Illustrator, FreeHand or Corel Draw. LSP Basic — $119 LSP Extended — $279 (Call for free brochure)

Decathlon Corporation (800) 648-5546 or (513) 421-1938
4100 Executive Park Dr. #16, Cincinnati, OH 45241 Visa/MC/AmEx

CIRCLE 533 ON READER SERVICE CARD

-DIGITAL COLOR PRINTS-

BIG, BEAUTIFUL AND IMPRESSIVE.

Merge text, graphics and photos from your disk or original art. Produce posters, billboards, backlits, convention displays and P.O.P. displays from Mac or PC from 8-1/2" x 11" up to 52" x 30' in one piece.

T-SQUARE EXPRESS
998 W. Flagler St.
Miami, FL 33130
1-800-432-3360
B.B.S. (305) 545-8180

The world's most popular data compression comes to the Macintosh! Now you can share information in a highly compressed format with Macintosh OR PC users.

PKZIP Mac™

MAC TO PC AND BACK!

totally compatible with PKZIP DOS 2.04g • built-in data encryption • error eliminating 32-bit CRC error checking • user selectable compression levels • much more

Call (513) 885-2031 Today!

ASi

CIRCLE 418 ON READER SERVICE CARD

Power Macintosh • FORTRAN 77

LS FORTRAN is an ANSI standard FORTRAN 77 compiler for the Macintosh or Power Macintosh. Features include: build-in debugging, support for mainframe extensions, background execution, scrolling output window, and optimized code generation. This popular, robust compiler is the complete solution to your FORTRAN programming needs.

Language Systems Corp.
100 Carpenter Drive
Sterling, VA 20164
800/252-6479 • 703/478-0191
703/689-9593 Fax

MAP Art MAPS FOR GRAPHIC DESIGN

FULLY EDITABLE WITH ILLUSTRATOR, FREEHAND & OTHER PROGRAMS!

World Maps
Continents
Major Countries with States & Provinces
US States with Interstates, State Highways, 3 Digit Zip Areas & Counties!

Visit us at MacWorld Expo Booth 952

"Fine Artwork" Macworld 1992

CARTESIA
55 S. Main St., Box 757
Lambertville, NJ 08530
Voice 609-397-1611
24 hr. FAX 609-397-5724

CALL FOR FREE CATALOG 800 334-4291

If 4th Dimension® is such a fantastic platform, why are so many 4th Dimension® applications so weak?

Because not only 4th Dimension® but also many other database packages are bought in the understanding that they automatically generate complicated user applications without effort on the part of virtually anyone.

The database development package publishers tend to sell their products under the "lets you create sophisticated multi-user applications quickly and easily" slogan and the computer magazine press happily propagates this complete nonsense.

Sophisticated multi-user applications need very careful consideration, analysis, design and lots of experience. When looked at closely, each economic activity turns out to have a personality of its own and software will only help such an activity if it provides support for and strengthens the characteristics it represents.

If you do not want to let all that wonderful database power slip through your fingers and go to waste, send us a fax and book some serious development or consultancy time! This could be your best investment in years!

THE d.i.d.CIRCLE® ORGANIZATION

The 4th Dimension® specialists on the client's side. World wide intervention.

4 rue de la Presse - 1000 Brussels - Belgium
847 A second avenue Suite 147 - New York N.Y. 10017 - U.S.A.
fax New York: (212)490.2885 - fax Brussels: (32-2) 218.3141 - fax France: (33) 90.51.61.99
AT&T Enhanced fax: GREAT BRITAIN: (44-171-) 410.0930 - U.S.A: (1-703-) 869.8709
JAPAN: (81-3-)5381.4860 AT&T subscriber ID: 5248724 ##.

4th Dimension is a registered trademark of ACI, ACI US INC.

Data Recovery in hours.

- Over 10 years of experience with clients worldwide including Apple, NASA, HP, and FedEx.
- We've recovered more than half-a-million megabytes of Mac Data alone.
- We guarantee successful recovery of your lost data, or you pay nothing.
- Express One-Day Service is available.
- Call 24 hours a day.

LAZARUS DATA RECOVERY

800-341-DATA

415-495-5550 • FAX 415-495-5553 • RESTRICTIONS MAY APPLY
381 Clementina Street • San Francisco, California 94103

CIRCLE 427 ON READER SERVICE CARD

"When data's destroyed, who you gonna call? DriveSavers."*

*Reprinted from LOS ANGELES TIMES, Jan. 18, 1995

DRIVESAVERS® DATA RECOVERY

Our proprietary techniques are so advanced, we can rescue data others might simply abandon. So, don't take chances with your data. If you can't afford to lose it, call DriveSavers. We've been restoring data and peace of mind since 1985.

400 Bel Marin Keys Bl. Novato, CA 94949 415-883-4232

Call: 800-440-1904

CIRCLE 510 ON READER SERVICE CARD

Active Buyers trust Macworld to deliver the products they need daily.

Macworld Shopper Delivers

NEXTWAVE
SERVICE BUREAU
35mm SLIDES & DUPES
4X5's & SCANS
PC & MAC
OVERHEADS
COLOR PRINTS
COMPETITIVE PRICING
PRESENTATION EXPERTS
voice 212/989-2727
outside ny 800/445-9002
bbs 212/989-3290
AMERICAN EXPRESS • VISA • MASTERCARD • DISCOVER

CIRCLE 488 ON READER SERVICE CARD

ONTRACK DATA RECOVERY
The World Leader in Professional Data Recovery Services!
•Mac Specialists
•Any Media
•All Operating Systems
•Emergency Services
Mention this ad for a FREE diagnostic evaluation!
Ontrack® DATA RECOVERY
East Coast: 1-800-872-2599
West Coast: 1-800-752-7557

CIRCLE 459 ON READER SERVICE CARD

Need Help Fast?
Call for Typesetters, Graphic Artists, Programmers, Network Installation & More
Washington DC • 202.338.4163
New York City • 212.924.3979
Philadelphia • 215.972.0105
St. Louis • 314.862.6227
MacSpecialists®
The people to power your Mac!™

CIRCLE 475 ON READER SERVICE CARD

DATA RECOVERY
It's our BUSINESS to keep you in BUSINESS
• 24 Hours a Day
• Data Recovery Guaranteed
• Professional Clean Room
• Expertise with most systems and storage devices
TOTAL RECALL™ Saving Data Since 1989
800-743-0594

CIRCLE 458 ON READER SERVICE CARD

SLIDES
From PC & Mac files $3.75
4x5 chromes/negs $20
Dye sub print/overhead $18
Hi Res Scanning $10
Call for special pricing on Quantity Duplication of Slides & Overheads
Show & Tell 39 W38th St., NY, NY 10018
212 840 2912 • 212 840 7953 (fax)

CIRCLE 550 ON READER SERVICE CARD

Super Service Bureau!
Iris Prints $25.00 (up to 10.6 x 17.2)
Lino Output $7.50 (1270 dpi - 8.5 x 11)
Displaymaker™ Ink Jet Prints $35.00 for 16 x 20 - Prints up to 3'x16'
Fiery Output $8.00 (8.5 x 11)
Quantity/Volume Discounts Available
Mac/Pc Files • Leaf Scans • Scitex Scans
4/C Sep's/Matchprints • Mounting/Laminating
Amex/Visa/Mastercard Accepted
24 hr Modem - (212-869-6963)
CALL US TODAY - 212-869-6960
MET PHOTO INC.
1500 Broadway, N.Y., N.Y. 10036

CIRCLE 465 ON READER SERVICE CARD

DATA RECOVERY
MACINTOSH SPECIALIST
• REMOVABLE AND OPTICAL DISK
• TAPE CARTRIDGE • POWERBOOK
• HARD DRIVES AND FLOPPY DISK
• Data Recovery Since 1989
• No Evaluation Charge • 1-2 Day Turnaround
• Mechanical/Electronic Failure, Virus or Data Corruption is Guarantee Recovery or It's Free
• Hard Drive Data Recovery Perform in Clean Room
1-800-469-2549
MICRO COM
19319 VENTURA BOULEVARD TARZANA CA 91356
TEL 805-582-9082 FAX 805-582-9102

CIRCLE 422 ON READER SERVICE CARD

!!!Repairs by Mail!!!
Repairs from $5.00!!! Same-day turnaround in most cases!! New and used hardware for sale! We buy dead Apples, Macs, PCs. Noon to 5:00, 6:30 to 10:00.
Arminius
8519 Orchard Avenue
Merchantville, NJ 08109
609-662-3420 (voice)
609-662-6460 (fax)

MAC REPAIR
Mac Shop Northwest
• Apple™ Certified Technicians
• One-Day Service Turnaround*
• Hard Disk Repair & Data Recovery
• Up to 75% below Dealer Rates
• Component-Level Repairs
• Expert Advice and Prices by Phone
• Power Supplies & Logic Boards*
• Lifetime Repair Warranty*
Tel: 1-503-642-3456
*on many repairs. Visa/MC/AX. Fast overnight shipping available. We use genuine Apple™ parts.
FEDERAL EXPRESS
1-800-MAC-SHOP

CIRCLE 515 ON READER SERVICE CARD

DIGITAL SERVICE BUREAU
Slides•Overheads
4x5's•Big Posters
Canon's•Dyesubs
Photo CD™
Professional PrePress Scans
35mm format-$.90 Pro/4x5-$8
Digital 4-Color Offset Printing
Call For Details...
Satisfaction Always Guaranteed
IMAGERS
(800) 232-5411®
1575 Northside Dr. Bldg.490 Atlanta 30318

CIRCLE 456 ON READER SERVICE CARD

Active Buyers include Macworld Shopper as part of their morning ritual.

Macworld Shopper Delivers

PROTECT YOUR MAC WITH ALL FABRIC DUST COVERS
ALL MAC SYSTEMS* CALL!
PERFORMA 575&KYBD.....$29.95
PERFORMA 636,14"&KYBD....29.95
PERFORMA 637,15"&KYBD....29.95
PWRMAC 6100,14"&KYBD....29.95
PWRMAC 7100,14"&KYBD....29.95
PWRMAC 8100 COMPUTER....15.95
APPLE DESIGN KEYBOARD.....9.95
APPLE MULTIPLESCAN 15".....19.95
APPLE MULTIPLESCAN 17".....24.95
APPLE MULTIPLESCAN 20".....29.95
IMAGEWRITER II.....15.95
STYLEWRITER II.....15.95
COLOR STYLEWRITER PRO....19.95
COLOR STYLEWRITER 2400...19.95
PERSONAL LSRWRITER 320...19.95
LASERWRITER SELECT 360...24.95
LASERWRITER PRO 630.....19.95
H-P DESKWRITER 550/560...19.95
VIZFLEX KEYBOARD SKINS....15.95
CUSTOM COVERS - NO SURCHARGE!
Unlike Plastic or Vinyl, these are Heat Ventilating and Will Not Shrink, Crack or Deteriorate with Age. • Machine Wash/Dry
100% Satisfaction Guarantee!
ADD $4 SHIPPING & HANDLING (CHECK/MO/COD) VISA/MC/AMEX)
CALL TODAY!! (800) 735-1584
ASK FOR FREE MONOGRAMMING WITH PURCHASE OF $40 OR MORE!
CO-DU-CO COMPUTER DUST COVERS
4802 W. WISC. AVE. #MW, MILW. WI 53208
414-476-1584 OR 414-476-9329 FAX

CIRCLE 414 ON READER SERVICE CARD

SAFEWARE
Insures Your Computer
The Computerowners℠ Policy insures you against theft, fire, accidental damage, lightning even power surge! Replace or repair for $49 a year. Available in the U.S. & Ontario.
1-800-800-1492
SAFEWARE, The Insurance Agency Inc.
2929 N. High St., PO Box 02211
Columbus, OH 43202

CIRCLE 426 ON READER SERVICE CARD

Name Chuck White
Title Computer Specialist
Company Honeywell
Age 38
Pets 2 cats
Hobbies Tennis, computers, music
Favorite Band Sade, Enya, Larry Carlton
Favorite Artist Ansel Adams
Favorite Color Blue
Favorite Shape Rectangle
Favorite Food Steak, pizza
Favorite Publication "*Macworld*. Because of its thorough and timely software and hardware reviews."
Macworld
THE MACINTOSH® AUTHORITY

Free Catalog!

"The Granddaddy of all CD-ROM catalogs is EDUCORP." — *Software Publisher Magazine*

FREE Shipping

Free express 2-day shipping on products marked with an '✈'.

Over 1,300 CD-ROM Titles in Stock

Games

50858	Blade	$19.95
50640	Arc of Doom	44.95
50573	Sea & Sky	27.95
50105	Lawnmower Man	44.95
50438	Rebel Assault	49.95
P1583	Spaceship Warlock Non-AV	19.95
50198	Dragon's Lair	39.95
50107	Myst	47.95
50599	SimTown (for kids)	38.95
50821	Lemmings/Oh No More	37.95

Entertainment

50661	4 Paws of Crab	$29.95
50389	Cookbook U.S.A.	27.95
50699	People Magazine 20 Yrs of Pop	22.95
50695	Dazzeloids	27.95
50319	Freak Show	34.95
50403	Maus	34.95
2095	A Hard Day's Night	27.95
50696	For All Mankind	27.95
1457	From Alice to Ocean	49.95
50820	Blam!	18.95
50757	Headcandy	26.95
50756	Residents Gingerbread Man	33.95
50656	Bubblegum Crisis Screen Saver	22.95
50548	Money in the '90's	29.95
50294	Xpora 1: Peter Gabriel's World	47.95
50657	Project A-KO Screen Saver	22.95
1300	EDUCORP Shareware 9.0 ✈	99.95
50642	Cosmology of Kyoto	67.95
50803	Sports Illustrated Almanac	39.95
50340	Marilyn & André ✈	54.95

Education

50801	Cartoon History of Universe	$37.95
50639	Small Blue Planet Cities Below	34.95
2090	Small Blue Planet Real Picture	39.95
50299	Learn to Speak Spanish 5.0	99.95
1642	Family Doctor	29.95
50421	Learn to Speak French 4.0	99.95
50278	Learn to Speak Japanese 3.0	63.95
1460	Mayo Clinic Family Health Bk	37.95
50113	Mayo Clinic The Total Heart	19.95
50624	A.D.A.M. The Inside Story	39.95
50870	Math Rabbit Deluxe	44.95
50867	Reader Rabbit 1 Deluxe	44.95
50880	Reader Rabbit 2 Deluxe	44.95
50881	Circus	27.95
50014	Oregon Trail	39.95
50836	Amazon Trail	42.95
50835	Yukon Trail	42.95
2078	Animal Alphabet	29.95

Reference

50719	Vistapro	$62.95
50122	Redshift MM Astronomy	49.95
50841	3D Atlas	59.95
50317	Street Atlas USA	69.95
50110	Encyclopedia of Dinosaurs ✈	39.95
1280	Encyclopedia of Life ✈	54.95
2081	ZooGuides v.1: Butterflies/World	39.95
1210	ZooGuides v.2: Whales/Dolphins 2.0	39.95
1275	ZooGuides v.3: Mammals of Africa	39.95
50300	ZooGuides v.4: The Rainforest	39.95
50817	ZooGuides v.6: Life in the Desert	39.95
50556	Masterworks of Japanese Painting	52.95
50037	History of the Blues	39.95
50852	Encarta '95	83.95
50309	Cinemania '95	56.95
1333	Groliers MM Encyclopedia '95	59.95
50246	PhoneDisc PowerFinder	139.95
50196	Select Phone	159.95
50671	Old Testament	99.95
50789	American Heritage Dictionary	37.95
50847	Amazing Animation	39.95
50617	Macmillan Dictionary Children	19.95
50863	The Way Things Work	48.95

Desktop Publishing

50447	EDUCORP Photo Sampler 2.0 ✈	$9.95
50329	EDUCORP Clip Art Sampler ✈	9.95
50204	Professional Backgrounds ✈*	64.95
50442	Earth & Space Photos ✈*	19.95
50590	Royalty-free Food ✈*	39.95
MB1	Medical Library Bundle ✈* 2-CD set. 200 royalty-free stock photos.	99.95
1680	Graphtec Graphic Designs ✈	39.95
P1330	Clip Art 3.0 ✈	19.95
50073	Design Toolkit Pro ✈	79.95
50885	Missy Hamilton's Textures ✈	79.95

Sale! As low as $3.95

P1948	Sports Illustrated 1991 Almanac	$5.95
L1774	I Photograph to Remember	9.95
L1777	Mozart: Dissonant Quartet	16.95
L1875	600 Days to Cocos Island	7.95
F900	Apple QuickTime CD	3.95

CD-ROM Drives

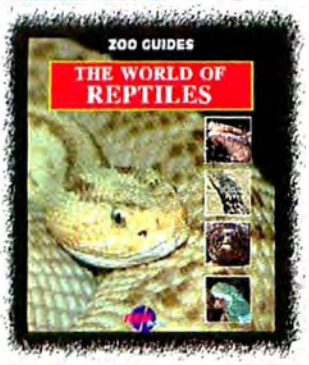
3501 Porta-Drive T3501 (Quad Speed) . . . $399
Free Lunicus, Mister X and CD Sampler.
Access Time: 150 ms, Data Transfer: 630 Kb/sec

More drives & bundles available, call.

*Titles are in KODAK Photo CD Format.

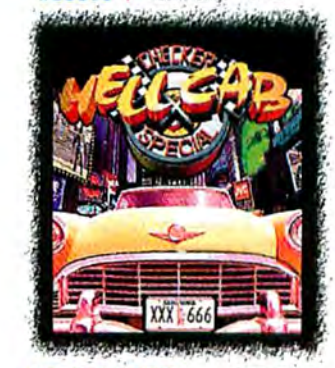
Better Dead #1467 Sci-fi thriller. **$49.95**

Star Trek Tech. Manual #50612 **$44.95**



ZooGuides v.5: The World of Reptiles #50816 **$39.95**

Midnight Stranger #50316 ✈ Adults Only. **$59.95**



Hell Cab #1476 Was $47.95 **$29.95**

1,000's of Fonts #P2067 ✈ **$19.95**

Foreign customers send $4 p/h for the catalog. With any purchase, you'll get EDUCORP's informative newsletter, free!

Prices subject to change without notice. Dealer inquiries welcome.

The Multimedia Pioneer

Circle 157 on reader service card

EDUCORP® 1-800-843-9497

W36 7434 Trade Street ■ San Diego, CA 92121 ■ Info: 619-536-9999 ■ FAX: 619-536-2345 ■ Internet: service@educorp.com

WISE GUY

BY GUY KAWASAKI

Cease and Persist

What? Guy defends Microsoft?

BACK IN FEBRUARY 1995, JUDGE Stanley Sporkin of the Federal District Court disallowed the consent decree that had been reached between the Justice Department and Microsoft. This decree had consummated many years of antitrust investigation of Microsoft—with a whimper, some say. Here's what I'd like to say to Judge Sporkin.

Dear Judge Sporkin:

Many Macintosh owners understand your reluctance to rubber-stamp the Justice Department's capitulation to Microsoft, but I think you should let the issue rest. I don't advocate this because Microsoft is innocent or because I like the company, but I do have my reasons.

First, interceding and severely punishing Microsoft would accelerate the wimpification of the personal computer industry, and wimpification is more dangerous to the industry than Microsoft is. Second, the seeds of Microsoft's demise have already been sown, so let the forces of nature take their course.

Wimpification

Most of the people who are complaining about Microsoft's actions are wimps. They could have dropped out of Harvard, like Bill Gates, to write software and start a company. They didn't. They finished their education—even getting advanced degrees like MBAs (using the term *advanced* loosely)—and became corporate pukes. Now they're blaming Microsoft.

These guys aren't the downtrodden masses eking out a living. Most pay themselves millions of dollars per year, and if they worked for Microsoft, they would be as vigorously defending its actions as they are now decrying them. Frankly, they should fix their own product development rather than blame Microsoft. The last time I checked, filing a lawsuit was not part of the product-development process.

Though you may not agree, the purpose of competition is, ironically, to end competition—to tilt the playing field and elevate your company to a position where other companies cannot compete. Microsoft's competitors tried to do the same thing, but they failed. Now their motivation is jealousy, not justice. For some reason, they believe that because they're dumb enough to give Microsoft their prerelease software, Microsoft should be dumb enough to do the same.

Microsoft deserves the rewards it's reaping. And any company that topples Microsoft deserves those rewards, as well. Sure, the government needs to protect citizens from a company with monopolistic powers that gouges people. But Microsoft's prices are reasonable—so reasonable that some companies claim they're too low. People can't have it both ways: if Microsoft charges too little, it's

unfair competition; if it charges too much, it's gouging.

As for products, with some exceptions Microsoft's are first-rate. There are millions of users of Microsoft products, and they aren't brain-dead automatons who will do whatever Bill Gates says. Consumers vote with their dollars. Witness, for example, Microsoft's failures in product categories such as flat-file databases (Microsoft File) and entry-level word processing (Microsoft Write).

The Seeds of Demise

My second point is that the demise of Microsoft is already inevitable, so you don't need to trouble yourself. I submit two pieces of evidence.

Exhibit 1. Word 6, a.k.a. "the bloody glove." What else but "demise" can anyone conclude about a company that ships a product like Word 6? There are only two explanations: Microsoft's testers were so stupid that they didn't notice how long it took to launch the thing, or Microsoft's management was so arrogant that it overrode the testers and shipped the bloody thing anyway. (I would guess the latter.) Either explanation screams "Demise."

Exhibit 2. The kind of people Microsoft is hiring. The current COO was hired from Procter and Gamble, the company that wrote the book on brand extension. And brand extension will start Microsoft down the slippery slope of mediocrity, because no company can be all things to all people. (Another company that tried to be all things to all people was IBM. I rest my case.)

Bill Gates wants it all: operating system, application software, online service, financial transactions, multimedia, and office machines. To get it all, you've got to have a lot of smart people. Microsoft already has more than its fair share of smart people, but Microsoft will go through a bozo explosion because it is now attracting the kind of people who want to work for a company that won't lay you off and looks good on your résumé.

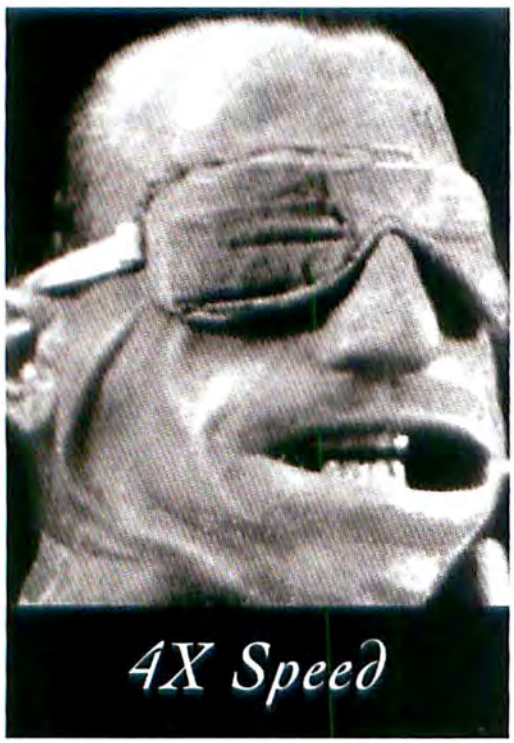
Closing Argument

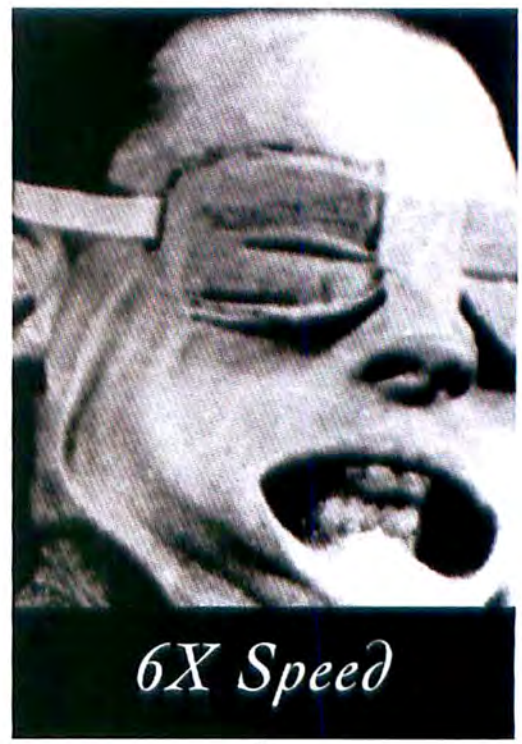
Your Honor, the best thing you can do for the health of the personal computer industry is stay out of this. Let Microsoft have its day, because it deserves it. For America's sake, send out a message to the Bill Gates wannabes that if they create good products and provide good service, they will be rewarded. So please cease and let entrepreneurship persist. ■

GUY KAWASAKI's views are his own and only sporadically represent those of *Macworld*. He is president of Fog City Software and has investments in Apple, Bit Jugglers, Bookmaker Corporation, Global Village Communication, and Intuit. He can be reached at **kawasaki@radiomail.net**.

JOHN RITTER

THERE'S
PUSHING
THE
ENVELOPE.
AND THEN
THERE'S
RIPPING A
HOLE
THROUGH IT.





IT'S HERE.

databases and business software that run faster than you imagined possible.

Of course, our internal and external MultiSpin 6X readers come with all the extras you'd expect from NEC. A two-year limited warranty. Mac and PC compatibility. Unparalleled 1-800 number support. And NEC's exclusive on-screen interface that makes your reader easier to use. Even better, our interface kits not only come with SimpleStart™ software, they actually turn "Plug and Play" into a reality. For more about our new 6X readers, just call 1-800-NEC-INFO.

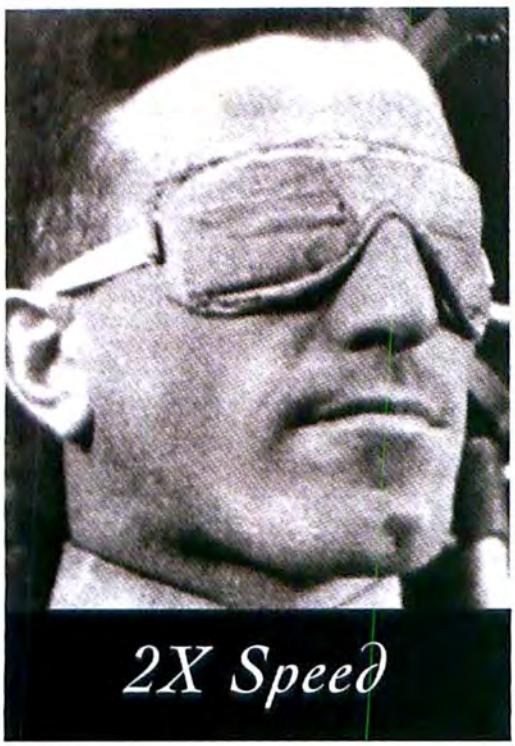
SEE, HEAR AND FEEL THE DIFFERENCE.

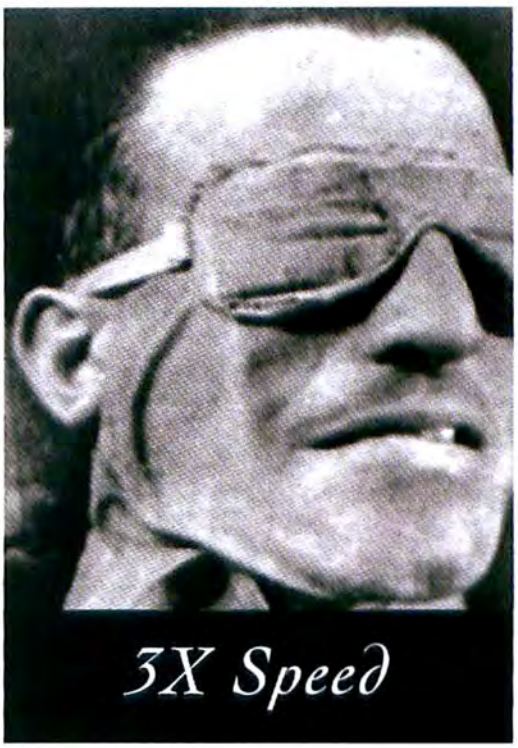
NEC

nd See, Hear and Feel the Difference are trademarks of NEC Technologies, Inc. NEC GSA# GS00K94AGS5241PS01

Key #26450

Circle 16 on reader service card





INTRODUCING THE NEC MULTISPIN® 6X CD-ROM READER.

Once again, the leader in CD-ROM technology has broken the speed barrier. With a blazing 900KB/sec transfer rate and 145 ms access time, NEC's 6X readers have taken multimedia to an all-time high. Suddenly, you'll experience smoother video and animation than ever before. As well as

For information via fax, call FastFacts™ (1-800-366-0476) and request document #237601. ©1995 NEC Technologies, Inc. MultiSpin is a registered trademark and SimpleStart, FastFacts

When your computer is swinging on the end of a handle, you don't want just an ordinary handle.

That's why the handle on our NoteBook Traveler Executive carrying case features an embedded metal bar tucked inside heavy-duty nylon webbing.

Industrial rivets secure the handle to a hidden iron plate. High quality EVA foam is then added for a secure and comfortable grip.

Of course, attached to the handle is the rest of our strong and sturdy case.

Features include reinforced stitching for added security, closed-cell foam padding for greater shock absorbency, PVC lining for maximum protection against puncture damage.

Each case comes with the unique Kensington Satisfaction Guarantee. It includes a lifetime warranty and a no-risk 90-day trial.

Choose from six different sizes and styles, each featuring a variety of pockets and compartments. For more information, call 800-535-4242. Outside US and Canada, 415-572-2700. For information by fax, call and request document 614.

NoteBook Traveler®

KENSINGTON

NoteBook Traveler and Kensington are registered trademarks of Kensington Microware Limited. All other registered and unregistered trademarks are the sole property of their respective owners. ©1995 Kensington Microware Limited 3/95